Forecast for '55

Chemical Week

January 1, 1955 Price 35 cents

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Here's how one specialties firm capitalizes on growing pet population . . . . . p. 78

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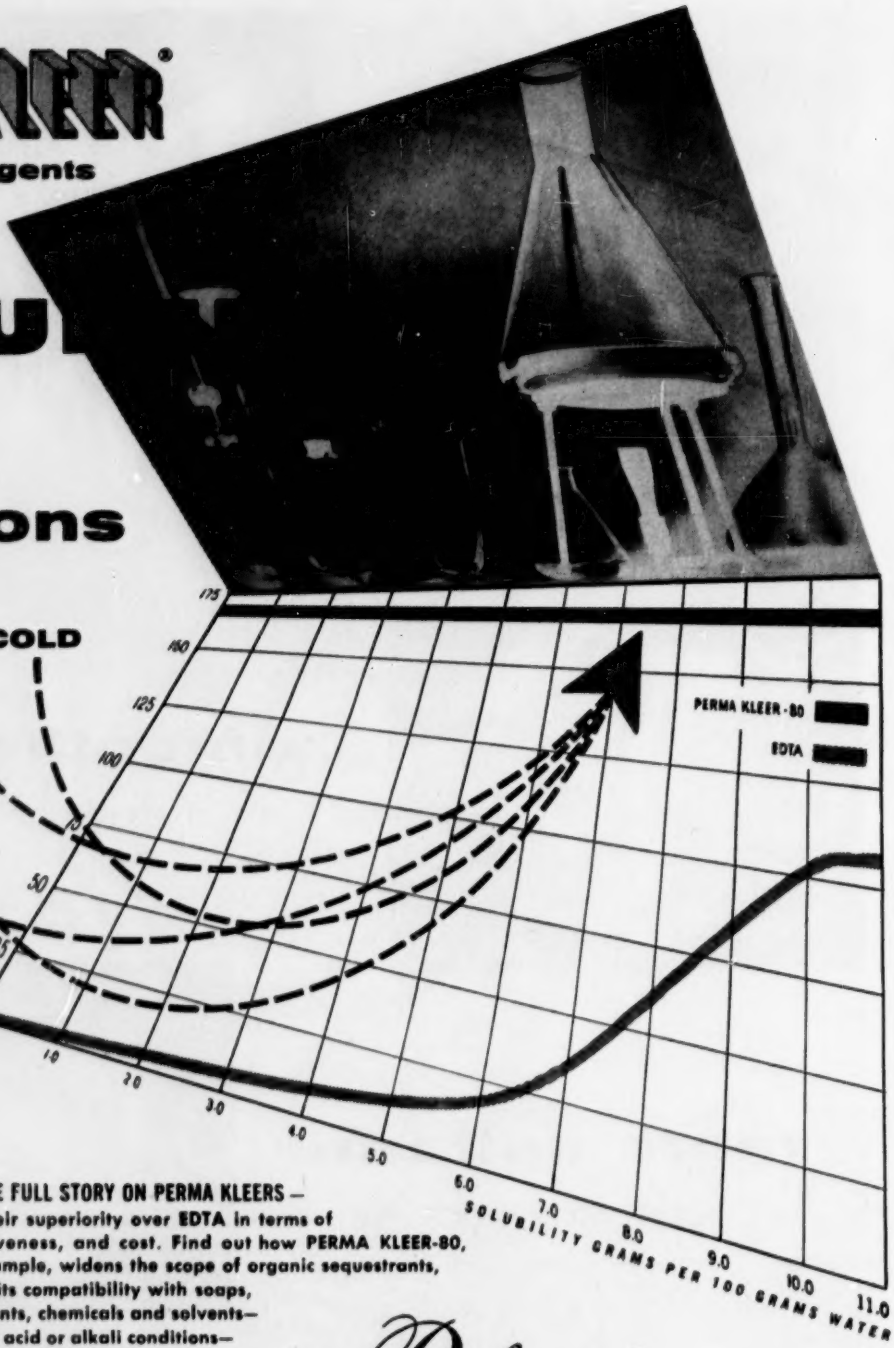
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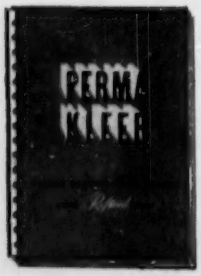
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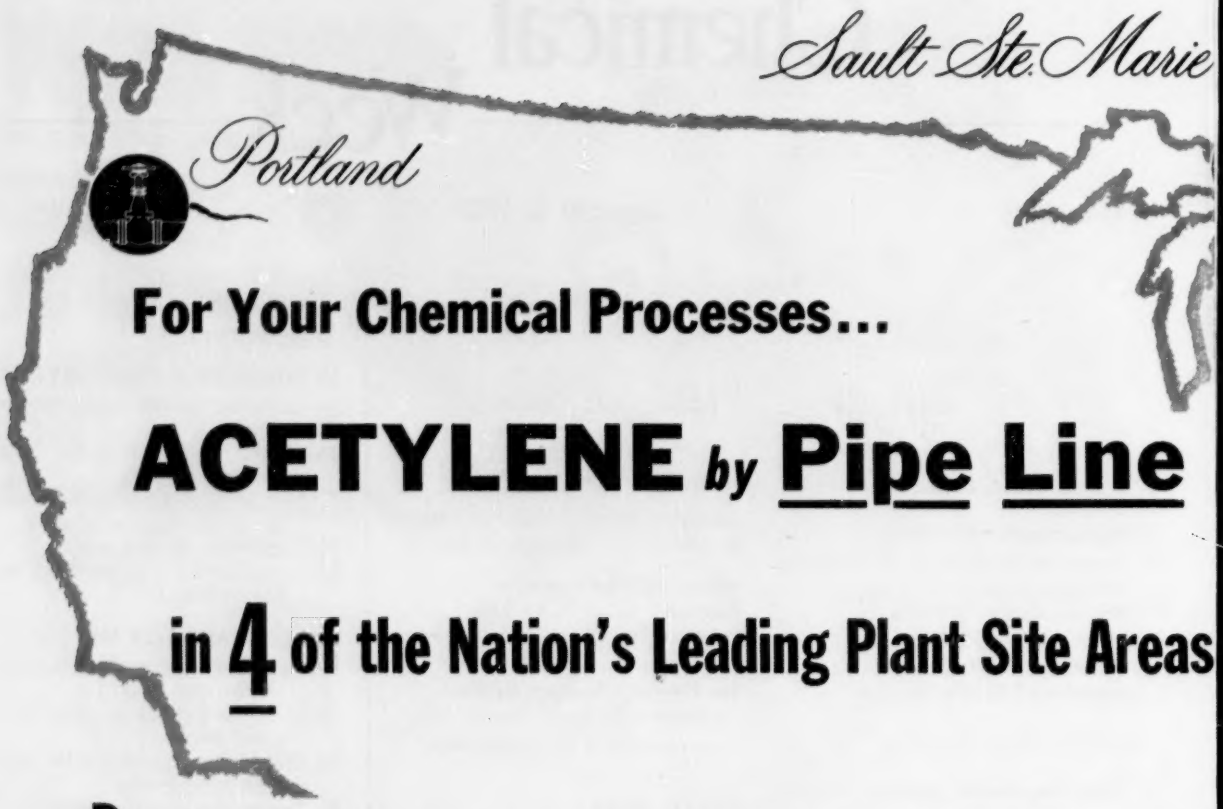
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OPINION . . . . . .

Redwood Defense

TO THE EDITOR: In the news article "Acrylics' Outside Chance" (*Nov. 20, '54, p. 114*) the following reference was made regarding the suitability of redwood for painting:

'Redwood is generally avoided—"it's miserable for any line of paints."'

This statement is at variance with the information published by the U. S. Forest Products Laboratory at Madison, Wis., and with the information that we have obtained during many years of experience with redwood.

The Forest Products Laboratory has been conducting continuous tests over the last 30 years or more to determine the paint-holding ability of various species of wood. Their conclusions are drawn from two sources, namely, "observation of practices and experience with houses in service, and experimentation by means of test fences." The Forest Products Laboratory classifies redwood among those "woods that hold paint longest and suffer least when protection against weathering becomes inadequate." *

During the first year or two after a paint has been properly applied, the nature of the wood usually has very little to do with the behavior of the paint coating. Later, when the paint coating begins to deteriorate, the nature of the wood has a pronounced effect on how quickly the finish will deteriorate. Redwood rates among the highest in possessing those characteristics that enhance paint retention and durability.** In addition to the desirable physical paint retention properties of redwood, the Forest Products Laboratory also states that there is evidence that the extractives in redwood exercise a favorable effect on the durability of paint.†

In many cases, finish failure is caused by an abnormal moisture condition within a sidewall, which is occasioned by faulty construction. In these instances, the deterioration of the paint is mistakenly attributed to the wood itself. A little booklet on the "Menace of Moisture," prepared by the National Paint, Varnish and Lacquer Manufactures' Assn., gives further information on the problem of moisture.

In view of the overwhelming body of evidence that supports redwood as being extremely well adapted to any of the common paints, it was with some dismay and concern that we read in the aforementioned article that "redwood is miserable for any line of paints." We would appreciate any information that you might have regarding the reference source for this statement.

GREGORY M. J. LAMBERT
California Redwood Assn.
San Francisco

Fundamentally, it's a question of semantics. More unambiguously we might have said that it's a miserable job to try to market any paint for redwood. The reason: most people who use redwood want to protect it and at the same time retain its natural beauty. Thus, special clear finishes have to be developed if the redwood market is to be successfully exploited. And that isn't easy, as many paint companies admit. One of the problems: some coatings tend to extract redwood resins, change color. The wood is, of course, easy to paint with pigmented paints—but that's seldom the redwood buyers' objective. —ED.

* "Wood Handbook," Forest Products Laboratory, Madison, Wis., p. 231-Revised 1940.

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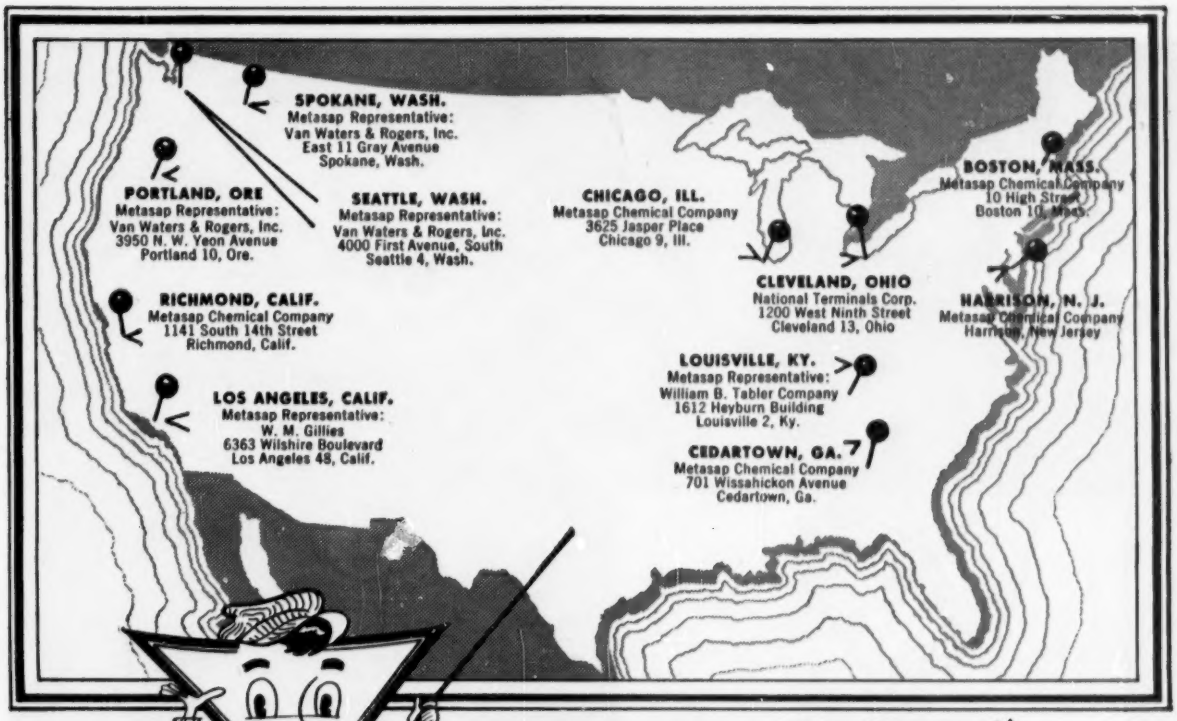
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Chlorine Institute, annual meeting, Biltmore hotel, New York, Jan. 26.

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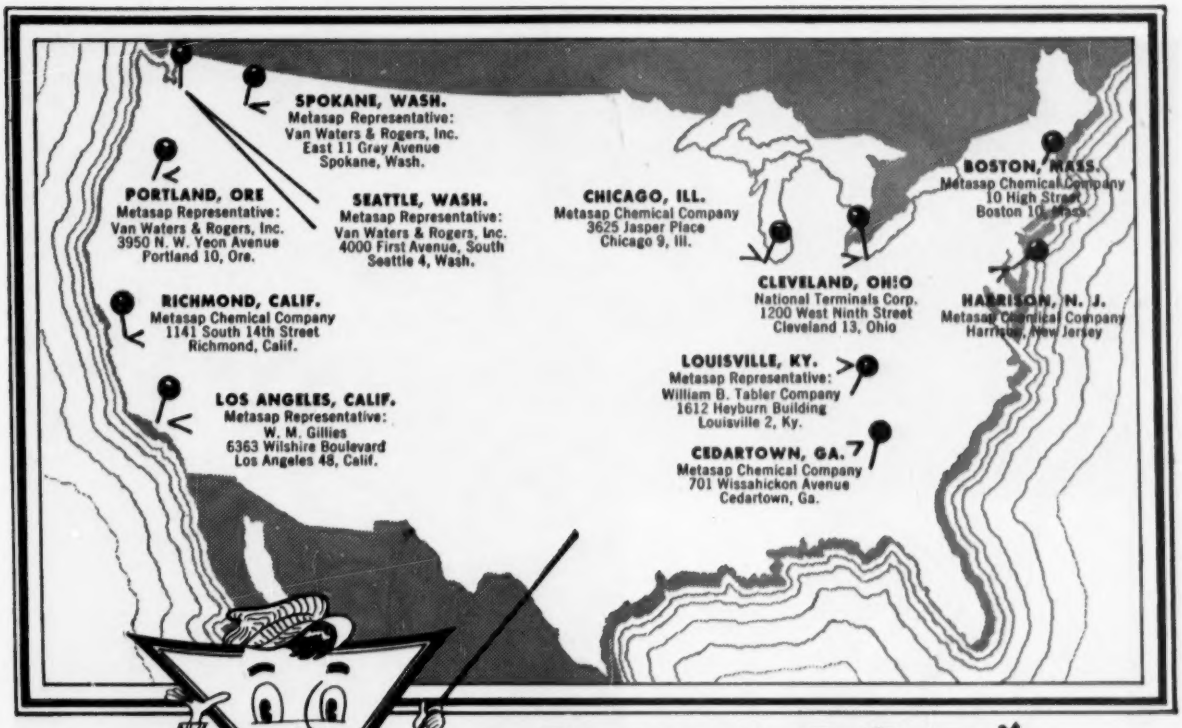
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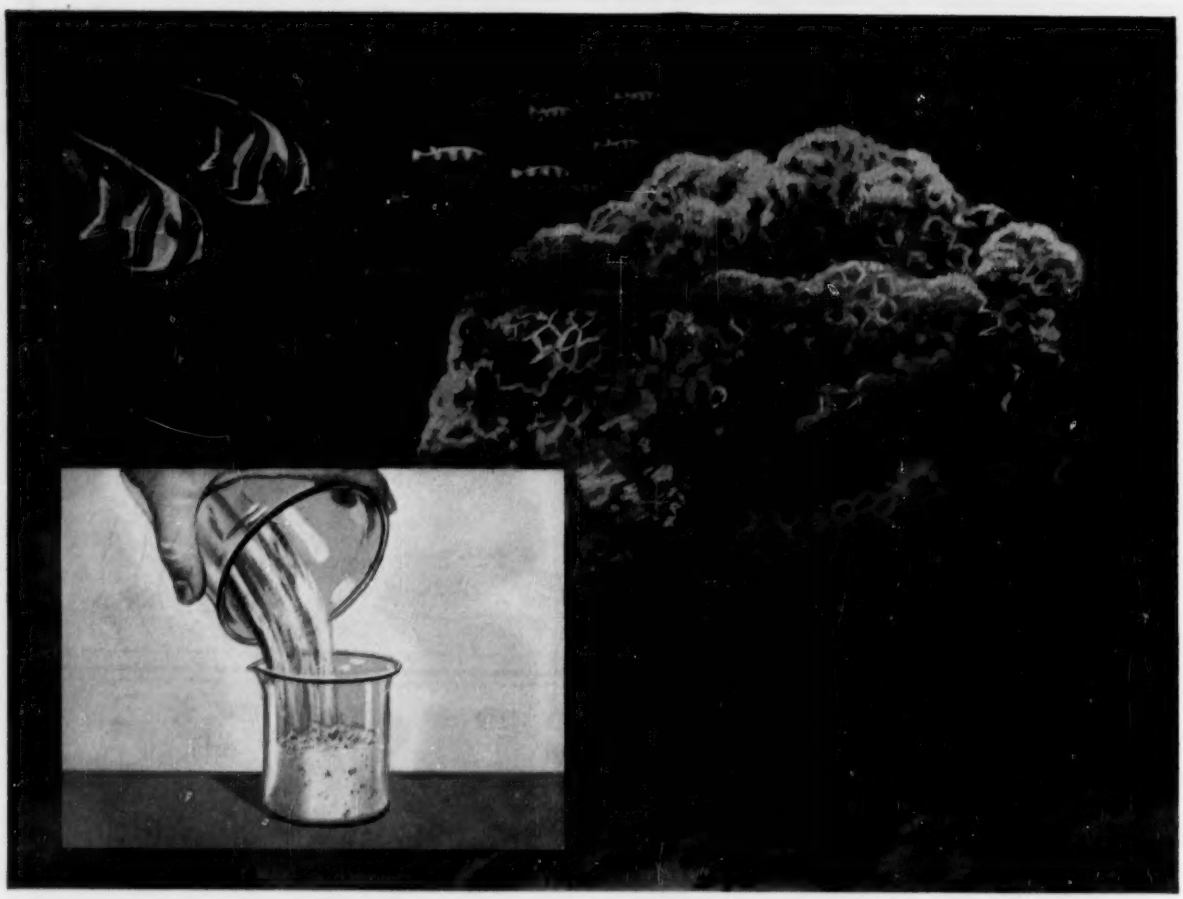
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NEWSLETTER

Look for another entry soon into Western ammonia. It's well known that Standard Oil of California, primarily through its subsidiary, California Spray-Chemical, has been studying the ammonia picture for the past couple of years. Previous investigations never gelled, but now it appears that Standard is virtually set to go on a major plant in California, to be onstream in the second quarter of 1956.

The facilities will likely be operated by the parent company's manufacturing division, but both Calspray and Oronite may well have a hand in the product's use.

•

Courtaulds (Alabama) Inc. is putting its chips on rayon's future. Completed only in 1953, the firm's LeMoyne, Ala., plant was designed to produce 50 million lbs./year of rayon staple. Last October the company decided to double its capacity by spring, and now it plans to increase it still more—to 150 million lbs./year—by September.

•

Dow Chemical has renewed its lease on the government-owned magnesium plant at Velasco, Tex., thus ending a three-months' squabble over the plant's future *(CW, Nov. 6, '54, p. 13)*.

Dow has operated the plant—the world's largest—for almost five years, and the renewal runs for three. Dow wanted to buy it, General Services Administration was eager to sell, but the Justice Dept. cried "monopoly."

Since Dow couldn't buy it, and GSA couldn't practicably sell it to someone else, Dow took up its lease renewal option. It plans to run the 44,000-tons/year plant at about 50% capacity this year.

•

Hard hit by synthetic detergents' inroads on coconut oil's markets, El Dorado Oil Works (San Francisco) will be taken over by Foremost Dairies via merger. One factor influencing Foremost's purchase: El Dorado's tax loss credit—it lost $1,657,000 in the three years 1951-53.

Likely to be dropped after the merger is El Dorado's unprofitable copra and coconut oil business.

•

New products and bold plans for the new year:

• Latest thing in aerosol containers is pancake mix, now being test-marketed in Milwaukee. All the cook has to do is squirt the batter on the grill.

• Procter & Gamble is test-marketing a dry heavy-duty bleach called Stardust—potential competition for Colgate's Pruf.

• Another new tradename to learn is Blem. It's S. C. Johnson & Son's new product to remove heat marks and white rings from dark furniture. It will be introduced this month.

• Helicopter service will be retained by Reichhold Chemicals to shuttle its executives from the New York airports to its headquarters in White Plains, some 20 miles distant.

You can expect to hear more about a new French pulping process currently being pushed in this country. Tagged the Delbay process, it employs a nitric acid digestion. While U.S. pulp experts are giving the method careful scrutiny, they are dubious about its merits.

They point out that pulping with nitric is an old idea. (A German plant tried it shortly before the start of World War II and maintained operations during the war.) They admit that, in some respects, nitric comes close to being the ideal pulping agent. But the reaction is exothermic, and the method has been considered too costly for commercial application.

The Delbay process, it is claimed, bypasses earlier objections and attains a few unexpected bonuses. The biggest claims made for it: plant investment—by French standards—is only half that for a conventional plant; operating costs are pared by 20%. American firms, however—coldly skeptical—will withhold judgment until they see some solid process data.

•

Twenty-four down and three to go. That's how the final count ran this week as the government's Rubber Commission added up the scorecard on signed agreements for sale of its synthetic rubber-producing facilities (see p. 14). Here's how the sales ran—on a state-by-state basis: In Texas, Houston butadiene plant to Food Machinery & Chemical, copolymer plant to Goodyear Synthetic Rubber; Baytown, butyl rubber and butadiene plants to Humble Oil & Refining; Port Neches, copolymer plant to Goodrich-Gulf Chemical, copolymer plant to Texas-U. S. Chemical (subsidiary of Texaco and U. S. Rubber), butadiene plant to Goodrich-Gulf and Texas-U. S.; Borger, butadiene and copolymer plants to Phillips Chemical.

In Louisiana, butadiene plant in Lake Charles, to Petroleum & Chemicals, Inc. (subsidiary of Cities Service and Conoco); copolymer plant in Lake Charles, to Firestone Tire & Rubber; butadiene and copolymer plants in Baton Rouge, to Copolymer Corp. (owned by seven industrial rubber users); butyl rubber units at Baton Rouge, to Esso Standard Oil Co. In Los Angeles, Calif., copolymer, butadiene and styrene plants to Shell Chemical, a butadiene plant to Standard Oil Co. of California; in Louisville, Ky., copolymer plant to American Synthetic Rubber Corp. (a consortium of 27 companies); in Akron, O., one copolymer plant to Firestone Tire & Rubber, another to Goodyear Synthetic rubber; in Kobuta, Pa., a butadiene-alcohol plant to Koppers Co.; in Naugatuck, Conn., copolymer and dodecyl mercaptan plants to U. S. Rubber.

Still unsold early this week: in Baytown, Tex., a copolymer plant; in Louisville, a butadiene-alcohol plant; and in Institute, W. Va., copolymer facilities.

When the Rubber Commission reports to Congress, contracts will then go before the Senate Banking, Currency, and House Armed Services Committees for final appraisal. Absence of a Congressional veto within 60 days means automatic approval of contracts as signed.

•

Trade liberalization has top priority on President Eisenhower's legislative timetable, and he will send a special message to Congress next week outlining his trade proposals in detail. Slated first: a three-year extension of the Trade Agreements Act with Presidential authority to cut tariffs another 15% over that period. Also listed: customs simplification, Congressional ratification of the General Agreement on Tariffs and Trade, now under negotiation in Geneva, and a 14% cut in taxes on income earned abroad by U. S. investors.

. . . The Editors

FAMILY PORTRAIT

Barrett Division

Coal-Tar Chemicals, Phenol, Acetone, Resins, Plastics and Plasticizers, Roofing, Insulating Board and other Building Products, Bituminous Road Materials, Pipeline Enamels.

General Chemical Division

Sulfuric and other Commercial Acids, Alums, Phosphates, Sodium Compounds, "GENETRONS" and other Fluorine Compounds, Reagent and Laboratory Chemicals, Insecticides, Weed Killers and Fungicides.

National Aniline Division

Dyestuffs and Certified Food Colors, Industrial Intermediates, Isocyanates, Synthetic Detergents, Pharmaceuticals, Nylon and its Intermediates.

Nitrogen Division

Anhydrous Ammonia, Nitrogen Solutions, Urea, "ARCADIAN" Fertilizers, Methanol, Formaldehyde, Ethylene Oxide and Glycol, Ethanolamines.

Semet-Solvay Division

Coke and By-products, Coal, Gas Producing Apparatus, Wilputte Coke Ovens, Polyethylene Products.

Solvay Process Division

Alkalies, Chlorine, Calcium Chloride, Ammonium and Potassium Compounds, Alkali Cleansers, Chloromethanes.

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Made in Carbon for High Purity

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THE SUPERLATIVE PURITY of V-C 85% N.F. Grade Phosphoric Acid is the planned result of a series of V-C processes utilizing the most modern facilities under rigid controls.

Elemental phosphorus, produced in advanced-type electric furnaces, is oxidized into phosphorus pentoxide and then hydrated with purified water in *fully-carboned* equipment. Impurities are removed with meticulous care and the resulting product is an odorless, water-white, sparkling-clear, syrupy phosphoric acid which surpasses National Formulary and American Chemical Society specifications and meets U. S. Food and Drug Administration regulations.

Because of its exceptional purity, V-C 85% N.F. Grade Phosphoric Acid grows ADP crystals without distortion. It is the only acid selected and used exclusively for this purpose by the world's largest manufacturer of synthetic piezo-electric crystals.

Virginia-Carolina Chemical Corporation produces a complete line of phosphoric acids, including 85% N.F. Grade, 80% and 75% Food Grades, and 62½% "wet-process" Commercial Grade. These acids are shipped in glass carboys, stainless steel drums, rubber-lined tank trucks and tank cars, with 48-hour tank truck delivery.

Basic in Phosphorus

THE BASIC POSITION of Virginia-Carolina Chemical Corporation in phosphorus and its growing family of useful compounds is the result of nearly a century of progressive pioneering, including this country's first mining of phosphate rock in 1868 and first commercial production of phosphoric acid in 1907.

The greatest V-C growth in phosphorus has occurred in recent years. V-C phosphate mining activities have been vigorously expanded and thoroughly mechanized. New V-C furnaces for producing elemental phosphorus are the most modern now in operation.

V-C has five phosphoric acid plants and is the only manufacturer of phosphoric acids both by the "wet process" and by phosphorus conversion. Other V-C facilities yield phosphoric anhydride, sodium orthophosphates and sodium polyphosphates, phosphatic specialties, and sodium metasilicate.

A V-C organophosphorus plant is in large scale production of alkyl phosphites, phosphonates, phosphorothioates, and other new organics. A semi-works unit is pioneering with new and highly promising chemical groupings based on phosphorus.

Enterprising research and progressive development are V-C traditions, constantly improving present products and processes, creating new products for new uses, opening new frontiers for chemical progress.

V-C Chemicals

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Phosphoric Anhydride
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Trisodium Phosphate
Sodium Tripolyphosphate
Tetrasodium Pyrophosphate
Dimethyl Phosphite
Diethyl Phosphite
Triethyl Phosphite†
Triisooctyl Phosphite†
Diethylethyl Phosphonate
Tetraethyl Pyrophosphate
Sodium Metasilicate
Ferrophosphorus
Slag
Phosphorus Trichloride
Phosphorus Oxychloride
Uranium Oxide
Di- and Trialkyl† Phosphites
Phosphonates and Diphosphonates
Phosphorothioates and Phosphorothioites
Alkyl Aryl Phosphites
Alkyl Acid Phosphates
and other organophosphorus compounds and phosphatic specialties.

†U.S. Pat. 2,678,940

VC CHEMICALS ®

Virginia-Carolina Chemical Corporation also produces—V-C® Fertilizers and V-C® Superphosphates...V-C® Phosphate Rock...Vicara®, Zycon®, Wavecrepe® and other zein fibers... V-C® Multiwall Paper and Textile Bags... Black Leaf® Pest Control Products...V-C® Cleansers. ®Reg. U.S. Pat. Off.

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Chemicals Division: 401 EAST MAIN STREET, RICHMOND 8, VIRGINIA

BUSINESS & INDUSTRY . . .

EASTMAN-U.S. CONSENT DECREE . . .

Here's What It Does—

- Provides classic example of Administration's new policy on antitrust enforcement: offer to negotiate, try to avoid costly trials.
- Sets precedent against "fair trade" agreements with a manufacturer who also competes as a retailer.
- Suggests a precedent on divestment policy when one company has a large share of a certain processing business.
- Gives competitors a chance to use Eastman know-how, patents, plant techniques.
- Induces new price competition in color-film sales and processing.
- Opens opportunity for competition in processing Eastman color film.

Settle First, Sue Later

There's evidence this week that—in one respect, at least—life may be getting simpler.

Unlike the recent antitrust suit against Du Pont and General Motors at Chicago (*CW, Dec. 11, p. 13*), which involved nearly five years of litigation and millions of dollars in legal expenses, the government's antitrust suit against Eastman Kodak Co. has been settled in relatively no time at all.

In fact, just to look at the entries in the federal court docket at Buffalo, you'd think that this case was merely a one-day trifle. The complaint was filed on Dec. 21, and on that same day, attorneys for both sides filed a consent decree making a trial unnecessary.

For Speed, Thrift: Despite the apparent rapidity with which the case was settled, the civil suit has sweeping significance for industry (*see box*). And there was no headlong haste in negotiating the settlement; it was hammered out during the five months since last July, when the Dept. of Justice notified Eastman that a lawsuit was contemplated. This system makes the lawsuit only a formality.

This is a clear illustration of the Eisenhower Administration's attitude toward antitrust—settle first, sue later. Ever since taking office in early '53, chief antitruster Stanley Barnes has been plugging for negotiation of consent judgments prior to taking court action, whenever possible.

For the government as well as the businessman, such a process—if successful—saves time and money by eliminating costly, protracted trials. It also simplifies the handling of complex cases.

FTC Not Concurring? Briefly, the suit charges that Eastman monopolized and restrained trade in the color film processing industry. Allegedly illegal practices included sale of film at a "fair-trade" price that included a fee for processing and developing, and sale of film only on condition that Eastman do all processing.

No one knows just yet what the actual competitive effects of the decree will be. Neither are government officials sure of what the settlement does to a case awaiting decision by the Federal Trade Commission against Eastman on the legality of Eastman's fair trade agreements. Eastman certainly is bound by the consent settlement; but FTC's opinions have indicated it was ready to sanction the fair trade agreements.

FTC's ruling—expected very soon—actually won't affect Eastman very much. But an FTC ruling approving the agreements will open a wide difference of opinion in the government's two major antitrust agencies, leave over fair-traders' heads an uncertainty that'll have to be cleared up in court.

New Line on Licensing

With legislatures about to convene in most of the 48 states, this week is squaring-off time for those two perennial adversaries on the question of whether corporations should be licensed to practice engineering—the Committee on Engineering Laws (which says "yes") and the National Society of Professional Engineers (which is generally opposed to the idea).

First move in this year's go-around is being made by an NSPE affiliate, the New York State Society of Professional Engineers. Its members are being polled on a proposed amendment to state law that would permit "qualified" corporations to furnish engineering services. (One requirement: that a firm's directors and officers be licensed engineers.) Returns on this poll are due Jan. 10.

CEL — which battled for more sweeping amendments to the state law in '53 and '54—has scheduled for next week an executive board meeting to decide whether to sponsor a different bill.

Aid to Iraq

Final approval has been granted by the Iraq Development Board to a contract between the Foreign Operations Administration and Arthur D. Little, Inc., Cambridge, Mass. covering an industrial survey to be made of existing Iraqi industries.

Special consideration will be given to develop industrial resources with marked emphasis on the exploitation of oil resources.

As a vital part of its long-term planning, Iraq has also established an independent government agency to administer oil revenue and arrange financing for development projects.



WIDE WORLD

JUDGE COLEMAN: In aerosol patent suit, he's backstopped by technical adviser.

Time Out for the Defense

Marking time in Baltimore this week is a new debate over an old problem in the chemical industry: How much "trade-secret" technology goes along with a scientist who leaves one employer to work for another?

That's a principal bone of contention in the aerosol shave cream patent suit being tried before Judge William Coleman in U. S. District Court in that city (*CW, Dec. 5, '53, p. 48*). Currently, there's a lull in the case because of the illness of Chicago attorney Benjamin Schneider of defense counsel; but action is slated to be resumed about Jan. 17, and the trial then will probably require another two weeks or so.

After that, lawyers for both sides will file written briefs for Judge Coleman and his technical adviser* to scan. Eventually, there'll be a decision on whether New York's Carter Products Co. has exclusive right to make and sell aerosol shave cream under its "Rise" patent (No. 2,655,480), or whether Jersey City's Colgate Palmolive Co. is in the clear with its "Rapid Shave"—which is patented in some countries but not in the U.S.

Appeal Likely: Whichever way the decision goes in district court, it's expected that there'll be an appeal. The market for such products—an estimated 50 million units/year—is too big to be lightly lost or forgotten.

The lawsuit, filed by Carter in Oct. '53, came to trial last Nov. 17. After five weeks of hearings, witnesses for the plaintiff had given their testimony and their cross-examination was nearly completed. That was when the defense attorneys asked for a "time out" for counsel Schneider.

Among witnesses for Carter: officials of Foster D. Snell, Inc., the New York consulting firm that helped develop Rise back in 1949; and officials of Du Pont's Kinetic Chemicals Division, which manufactures Freon aerosol propellants.

Injunction Asked: Brunt of Carter's complaint is that Colgate "wrongfully obtained" the crucial trade secrets about Rise from Norman Fine, who joined the Colgate staff in 1950 after having worked on the Carter project as a chemist for Snell. Carter is asking punitive (but unspecified) damages and an injunction to stop Colgate and others from infringing the Rise patent by making and marketing rival products.

Colgate's contention is that the patent should be declared invalid, on grounds that pressurized lather was within the common knowledge of workers in the art. To back this, Colgate cites earlier patents dating back to the mid-1920's. Colgate emphatically denies any "unfair competition."

* Columbia's Prof. Victor LaMer.

Under the Wire

The Rubber Producing Facilities Disposal Commission has completed a plan for putting the government's synthetic rubber plants into private hands.

The commission, which had a Dec. 27 deadline for signing contracts, arranged for sale of more than the 543,000 long tons of GR-S copolymer and butyl rubber capacity that Congress set as minimum for disposal.

Total capacity contracted for: 737,000 l. t.; probable price: $270 million. See total list of sales in Newsletter, p. 10.

Most plants are to go to companies that have been operating them all along.

But there are notable exceptions: Food Machinery & Chemical Corp. outbid several other firms for the petroleum butadiene facility at Houston, now operated by Sinclair. Shell Chemical, which had operated a similar plant at Los Angeles, expanded its scope to include the styrene and copolymer plants there. Dow Chemical and Midland Rubber (a subsidiary of Minnesota Mining & Mfg.) are the present operators.

Koppers Co. purchased the alcohol butadiene plant at Kobuta. Because of its high-cost process, many observers were dubious that this plant would be sold; however, Koppers' styrene facility there receives its utilities from the butadiene plant.

Neatly untangled was the 180,000-l. t. installation at Port Neches, Tex. Goodrich-Gulf Chemicals and Texas-U.S. Chemical each contracted for a copolymer plant; they will jointly operate the single butadiene unit.

The commission now must report to Congress by Jan. 27 the prices negotiated for each plant and show that each gives the government a "full, fair" return. Too, the commission must show that the disposal package provides for future defense needs, assures small business of needed rubber, and does not further any monopoly.

There won't be much of a case congressmen can make on monopoly, since government antitrusters have checked each signed contract. Some Democrats have already started leveling "give-away" charges, but until the commission report is submitted, there's no way of telling whether they have a chance of blocking the rubber sale.

SAFETY BECOMES A SCIENCE

(Injury frequency rates in chemical process industries, compared with all-manufacturing averages. Source: U.S. Dept. of Labor.)

Industry Classification	Calender Years 1952	1953	% Change Safer	% Change Less Safe	First Nine Months, 1954
All-manufacturing	14.3	13.4	6.3%		11.7
CHEMICALS AND ALLIED PRODUCTS	10.1	9.1	9.9%		8.5
Industrial inorganic chemicals	8.0	7.2	10.0%		6.6
Plastics	5.4	5.0	7.4%		4.6
Synthetic rubbers	3.3	3.3			3.0
Synthetic fibers	1.6	1.7		6.2%	2.1
Explosives	3.4	3.6		5.9%	2.2
Drugs and medicines	8.7	8.7			8.1
Soaps and related products	9.4	8.3	11.7%		6.8
Paints, pigments and related products	11.7	10.9	6.8%		10.3
Fertilizers	19.8	18.2	8.1%		16.2
Vegetable and animal oils and fats	22.5	25.4		12.9%	20.4
Compressed and liquefied gases	11.8	9.2	22.0%		8.4
Miscellaneous chemicals and allied products	17.9	17.5	2.2%		17.7

Better Bet for Longer Life

Lost-time accidents, it appears this week, are on their way out in the chemical process industries.

While eradication of such accidents probably won't be achieved this side of utopia, chemical companies already have passed one major milestone: a more than 50% reduction in injury-frequency rate since the high-water mark during the rough and ready days of World War II.

Out last fortnight are figures from the U.S. Labor Dept. showing that chemical firms cut their accident rate by nearly 10% in 1953 and that another 8% improvement was made during the first nine months of 1954. This brought the industry's frequency rate down to about 8.5 disabling injuries per million man-hours worked, compared with '44's lamentable 18.6 level.

Better than Average: It's to be noted that the chemical industries' accident rate is considerably better than the all-manufacturing average, which showed that work injuries during 1953 and '54 were less frequent than ever before in U.S. factories, warehouses and offices.

"This record," remarked Secretary of Labor James Mitchell, "bettered our most optimistic predictions, and reflects the substantial extension of safety activities by both industry and government."

The fact is, of course, that industry has drafted specially trained safety engineers to make accidents as improbable and as trivial as possible, and this investment is paying off in higher production and lower payments for workmen's compensation insurance. The chemical industries' ninth-place ranking among the 21 manufacturing industry groupings and the recent safety record gains indicate that chemical company employees have increasingly better chances to live to compulsory retirement age and beyond.

Drug Accidents Minor: In injury severity rate, the chemical industries' 1.1 mark was slightly better than the all-manufacturing average of 1.2 man-days of lost time for each 1000 employee-hours worked. Within the chemical grouping, this rate ranged from a low of 0.4 among makers of drugs and medicines up to 3.2 in fertilizer companies.

Chemical injuries broke down like this: temporary disability, 96.1%; permanent partial disability, 3.2%; death and permanent total disability, 0.7%. For all manufacturing activities, the corresponding figures were 94.2%, 5.4%, and 0.4%. Average number of days lost for each temporary disability injury was 18 for both chemical and all-manufacturing; but on permanent partial disability, lost-time figures were 1166 days per chemical injury and 871 days as the all-manufacturing average.

Within the chemical industry, the average number of days lost per case ranged from 45 in drugs and medicines up to 164 in fertilizers.

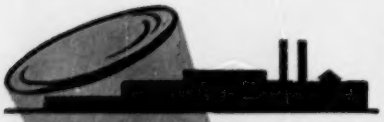
Multipriced Imports

So far, only cosmetics companies appear to be concerned, but ultimately other chemical process companies may become aware of a new legal tangle. If the Lanham and Sherman Acts overlap on the Tariff Act of 1922, then the U.S. market may be opened to a flood of foreign-made trademarked imports at low prices.

Here's how the legal snarl came up. For many years, foreign-made goods have been sold to affiliated companies for exclusive distribution in the U.S. The foreign producers sell those same goods, often under the same trademarks, in various other countries—but at much lower prices. Under the 1922 tariff law, the U.S. affiliates have been able to keep out of the country any goods bearing the same trademarks that were bought abroad by non-licensed importers.

Thus U.S. distributors—and indirectly, the domestic producers of competing products—have been protected from commercial importation of goods purchased abroad at the much lower prices. Now, however, the Treasury Dept. is taking a new tack, based on the Lanham Act of '46. That law says nothing about keeping out legitimately branded goods, but authorizes owners of U.S. trademarks to bar "imitations."

The Justice Dept. backs up the Treasury Dept. on the applicability of that clause, but goes farther. It says that the Sherman Act prevents an international enterprise from using its U.S. trademarks to seal off its U.S. market from the competitive effects of its foreign business. This is the big contention in the three perfume anti-trust suits (*CW, July 3, '54, p. 24*) pending in New York. These cases are expected to be consolidated for trial, and their outcome may provide the solution of the whole mix-up.



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Give a PERMA-LOK Fibre Drum a thorough test. We'll send you one at no cost. Simply request it on your company letterhead. No obligation.

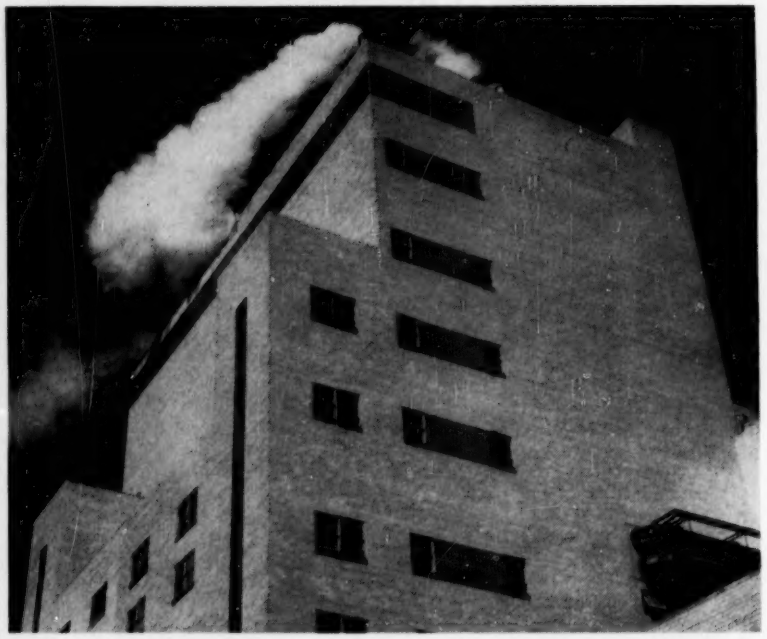
PERMA-LOK Fibre Drums are being used for both bulk and semi-liquid shipments. Protection from contamination is assured—an economic factor in avoiding spoilage. To meet specific requirements, special linings, coatings, and treatments are incorporated into the construction of the drum. For example, paraffin, special waxes, resins, or water-vapor barriers are used as the product may require. The exteriors may be lacquered or coated with pigmented paints for an attractive finish. Smooth, sanitary interiors give fibre drums added value.

PERMA-LOK'S exclusive "Never-Seep" crimping is a process that bonds the fibre wall and metal bottom into *one* integral unit. The iron-like grip protects against loss or seepage . . . protects against contamination too because dirt, dust, or foreign elements cannot work *into* the container. PERMA-LOK'S patented crimping process gives you maximum strength and durability. That means longer life . . . more ease in handling, no matter how much the drum is rolled from place to place.

Fibre Drums are available in a wide range of sizes. We will engineer the perfect fibre container for your product. Quick service on all orders.

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SOLVAY'S PROCESS DIV.'S new plant in Syracuse, now in operation.

EXPANSION . . .

Soda Ash: Just completed late last month was Solvay Process Division's (Allied Chemical & Dye Corp.) new soda ash plant at Syracuse. The new facilities will replace units that have been in operation more than 40 years.

•

Ammonia: Grace Chemical Co.'s multi-million-dollar ammonia-urea plant at Woodstock, Tenn., has started operations. Built at a cost of $20 million, the plant's daily production is rated at 250 tons of ammonia, 150 tons of urea.

COMPANIES . . .

Dewey and Almy Chemical Co. (Cambridge, Mass.) has taken options on a 19-acre plant site in Lexington, Ky. Cost or starting time of plant construction have not been released.

•

Rayonier, Inc., has by now acquired 80% of the capital stock of Alaska Pine & Cellulose, Ltd. from the Koerner interests and from Abitibi Power & Paper Co. (*CW Newsletter, Dec. 4*). Next move: an $8-million investment to bring current facilities into full working operation.

•

Stockholders of Goodyear Tire & Rubber Co. approved a two-for-one common stock split effective Dec. 30. After the redistribution, Goodyear will have some 9.1 million shares outstanding out of an authorized issue of 15 million shares. A reduction in par from $10 to $5 was also approved, the number of common shares released from preemptive rights of stockholders increased.

•

The Modern Fuel and Ammonia Co. has been incorporated in Natchez, Miss. Authorized capitalization: $20,000.

•

Nox-Rust Chemical Corp. (Chicago) will change its name to Daubert Chemical Co. (Chicago) effective today.

•

Negotiations for the merger of the Corn Processing Division, Clinton Foods, Inc. with National Starch Products, Inc. have been discontinued.

•

A registration statement covering an offer to shareholders of up to 921,923 additional shares of Aluminium, Ltd. has been filed with the Securities & Exchange Commission.

Shareholders of record Jan. 7 will be eligible to receive transferable subscription warrants expiring on or about Jan. 31, on the basis of one share for every 10 shares held.

Proceeds from the stock sale will be used for general corporate expenses.

Too Even for Action

There's a somewhat better chance now that chemical manufacturing operations won't be tied up because of truck drivers' strikes.

This is one effect of the flurry of decisions with which the National Labor Relations Board wound up the past year, most significant of which was its 3-to-2 vote to uphold the "hot cargo" clause in contracts with the International Brotherhood of Teamsters (AFL).

Now, however, it appears that the board is entering a period of relative inactivity. One reason: in losing Republican member Albert Beeson, formerly industrial relations director for Food Machinery & Chemical Corp., the board's membership has shrunk to four men—two Republicans and two Democrats. Prior to Beeson's appointment last year to serve out an unexpired term, that 50-50 make-up proved to be too even to handle many cases.

A second reason is that there's still no successor for George Bott, whose four-year term as NLRB general counsel ended Dec. 20. So far, Democrats in the Senate are not sold on President Eisenhower's nomination of Theophil Kammholz as successor.

Chief among the board's latest rulings (*see box, below*): that if an employer consents, employees can refuse to handle goods made by a firm involved in a labor dispute. Dissenters call this a secondary boycott.

NLRB's Year-End Decisions

- "Hot-cargo" agreements are valid—but only if the trucking employer doesn't change his mind.
- Losing a representation election needn't keep a union from filing a refusal-to-bargain charge.
- A one-day walkout is grounds for an employer to refuse to bargain with the union concerned.
- Labor disputes in national defense work at nonprofit institutions come under the T-H law.

AMSCO SOLVENTS

WHAT YOU WANT
WHEN YOU WANT IT
WHERE YOU WANT IT

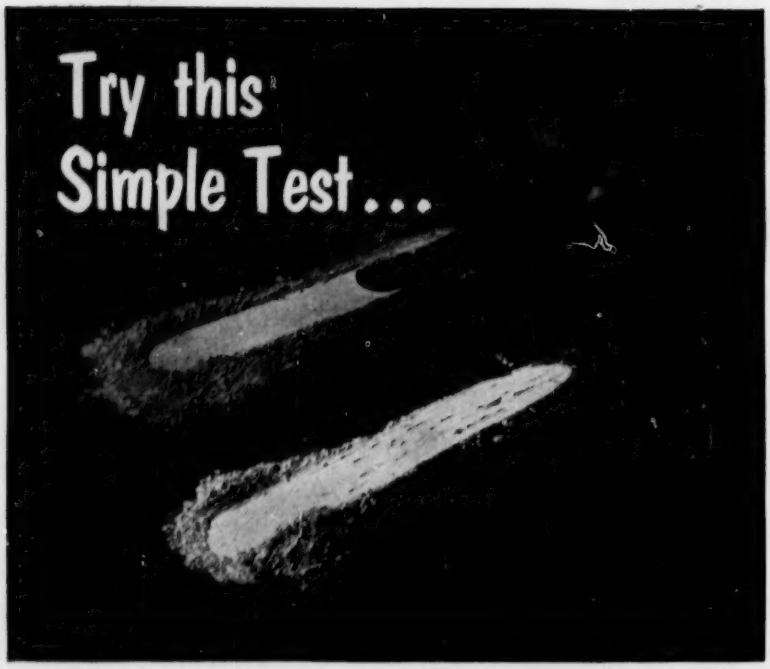
AMERICAN MINERAL SPIRITS COMPANY
SINCE 1923 New York • CHICAGO • Los Angeles
Service in 48 States
Offices in 24 Principal Cities



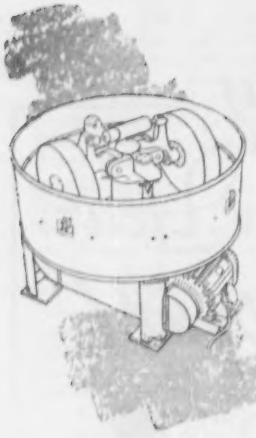
Happy New Year
Start it right!

UTILIZE OUR 24 YEARS EXPERIENCE
and
OUR COMPLETE LINE OF PRIMARY PLASTICIZERS.
24 Years of producing high quality plasticizers.
First to commercially produce DOP.
Largest manufacturer with plasticizers as the major product.

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FOOD MACHINERY AND CHEMICAL CORPORATION
NITRO, WEST VIRGINIA



to prove Simpson Mix-Mullers provide efficient, accurate blending



Run a spatula through a small amount of the product you are now mixing. Unmixed smears and tell-tale lumps, as shown in the lower smear, mean your product is *not* being thoroughly mixed and blended. Note the top smear . . . it's smooth . . . thoroughly and evenly blended . . . the way your product would be if it were mixed in a Simpson Mix-Muller.

This simple test proves that the intensive rubbing and smearing action of a Simpson Mix-Muller will do a more thorough, controlled mixing job on your product . . . similar to the long proven mortar and pestle mixing method. Simpson Mix-Mullers are equipped with spring loaded mullers . . . adjustable for variable pressure . . . providing maximum flexibility to meet every mixing requirement . . . in batch capacities from 1/10 to 60 cu. ft.

Investigate controlled mulling with Simpson Mix-Mullers. Write today for full information.

Use our Free Laboratory Service . . .

We have a completely equipped laboratory for accurately determining the results of mulling your materials in Simpson Mix-Mullers. A confidential test will prove what these modern mixers can do for you. Write for details . . . no obligation, of course.



SIMPSON *MIX-MULLER*® DIVISION
NATIONAL ENGINEERING CO. (Not Inc.)
642 Machinery Hall Building
CHICAGO 6, ILLINOIS





METERMAKER BROOKS: For metering tubes, court clearance.

LEGAL . . . . . .

Tube Patent Voided: The U.S. Supreme Court's recent refusal to review a decision by the Court of Appeals in Philadelphia has finally ended the patent infringement suit over rib-guided metering tubes in favor of Douglas Brooks and his Brooks Rotameter Co. of Lansdale, Pa., against Philadelphia's Fischer & Porter Co.

In the trial court, a jury had awarded Fischer & Porter Co. $14,000 damages; but the appeals court ordered the case retried on the ground that the jury lacked technical competence. In the second trial, the Fischer patent (No. 2,441,350) was found invalid, and this was upheld in the circuit court.

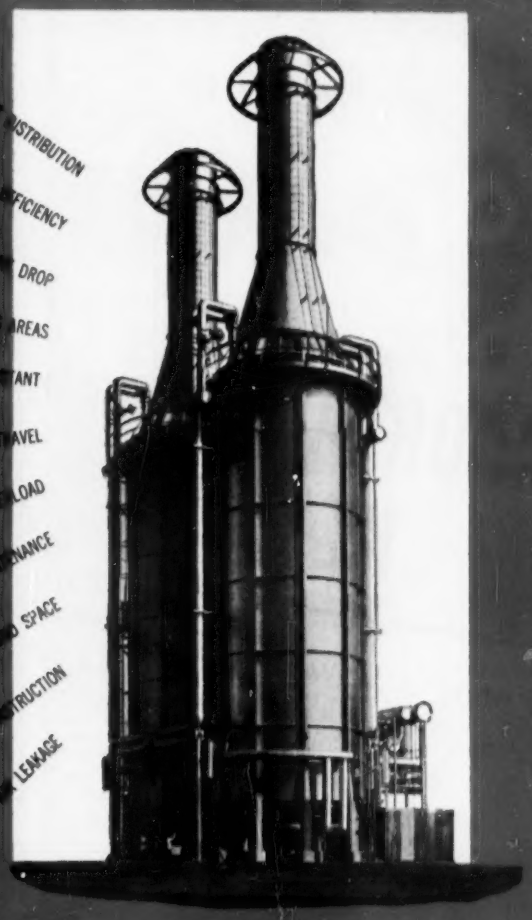
Both firms will continue manufacturing the tubes, Fischer contending that its product does not infringe the Cox patent (No. 2,417,352) under which Brooks is licensed.

•

Zoning Restrictions: Sometimes chemical process companies are readily accommodated by zoning boards; sometimes they have to go to court:

- At Wilmington, Del., officials have approved a zoning plan that "substantially" meets the needs of Tide Water Associated Oil Co. for its contemplated $75-million refinery.
- Virginia's Supreme Court will hear arguments this month on Hercules Powder Co.'s attempt to invalidate a restriction against wood pulp manufacture at Hopewell.

If yours is a fluid heating problem



PETROCHEM-ISOFLOW FURNACES

are most efficient by any comparison

MAXIMUM FUEL EFFICIENCY

1. The generic design of Iso-Flow heaters, **including the re-radiating cone,** gives excellent heat distribution and eliminates localized over-heating. **2.** All walls are protected by tubes which create low refractory wall temperatures. **3.** The refractories have high insulating characteristics which create minimum outside shell temperatures and, hence, exceedingly low radiation. **4.** With a radiant loss of under 2% more heat is absorbed by the fluid being heated. This results in higher efficiency for any type of Iso-Flow design. **5.** Since Petro-Chem designs include a wide variety of convection sections all heaters can be engineered for optimum fuel efficiency or for maximum fuel efficiency where the price of fuel and other economic considerations justify.

More than 1200 PETROCHEM-ISOFLOW FURNACES are in operation throughout the world in the petroleum, chemical and allied industries... for all processes and for any duty, pressure, temperature and efficiency ... and all Petrochem-Isoflow Furnaces are pre-eminently satisfactory.



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To meet the increasing demand, we have added a new facility. Now you can conveniently arrange for Metal Hydrides' Custom Reduction Division to carry out *hydride* reductions for you. This new service now makes it possible for you to achieve the advantages of hydride reductions without having to tie up your facilities or develop new techniques.

Men who know hydrides best . . . pioneers for seventeen years in their manufacture and application . . . are at your service. The Metal Hydrides sales staff will gladly show how this new service can be profitably and promptly applied to take your developed process from the laboratory to commercial production. Write, Wire, or Phone today! No obligation, of course.

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Metal Hydrides
INCORPORATED

22 Congress St., Beverly, Mass.



BURKE & DEAN, CHICAGO

ICWU'S GARFIELD: Without election, no switch to insurgent union.

LABOR . . . . . .

Intra-Union Ruckus: The wounds that hurt International Chemical Workers Union (AFL) throughout the past year aren't all healed yet. Next week at Louisville, Ky., a municipal court judge will hold a hearing for a union organizer charged with having converted to his own use $23,000 from the treasury of ICWU Local 521. The organizer, Paul Rasmussen, asserts that the local's membership has voted to disaffiliate from ICWU and to line up with the insurgent groups that are still sticking with H. A. Bradley, who was defeated last summer in his bid for an 11th consecutive one-year term as president of ICWU.

Leading the fight to keep Local 521 inside the ICWU fold is regional Vice-President Sidney Garfield of Chicago, a prime mover in the battle against Bradley at the 1954 convention. Garfield's contention: that ICWU is certified by NLRB to bargain for the Hoosier Ordnance Work's 1700 employes under a contract that runs to March, and that only through an NLRB election can a new bargaining agent be designated.

ICWU's Canadian Vice-President Gordon McIlwain says his district's members "have put politics to one side and have accepted in a democratic spirit the results of the Chicago convention"; but it was noted that only 35 of the approximately 80 ICWU locals in Canada were represented at the recent district meeting in London, Ont.

DAVISON BULLETIN

LIGHT AS A FEATHER

SYLOID® 244

Syloid 244 is a highly porous pure silica gel of extremely low density. A free-flowing white powder, it appears as a fluffy snow weighing 4-4.5 pounds per cubic foot as shipped. Syloid 244 has an apparent particle size of 2-3 microns, yet individual particles are predominantly below one micron.

The chemical and physical characteristics of Syloid 244 makes it adaptable for many uses including the following:

- **anti-blocking of clear plastic film**
- **an additive to inks for quick-drying**
- **a vinyl flatting agent**
- **anti-caking for powdered products**
- **thickening agent for salves, lubricants and plastigels**

Progress Through Chemistry

DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.

Baltimore 3, Maryland

Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole Producers of DAVCO® Granulated Fertilizers.

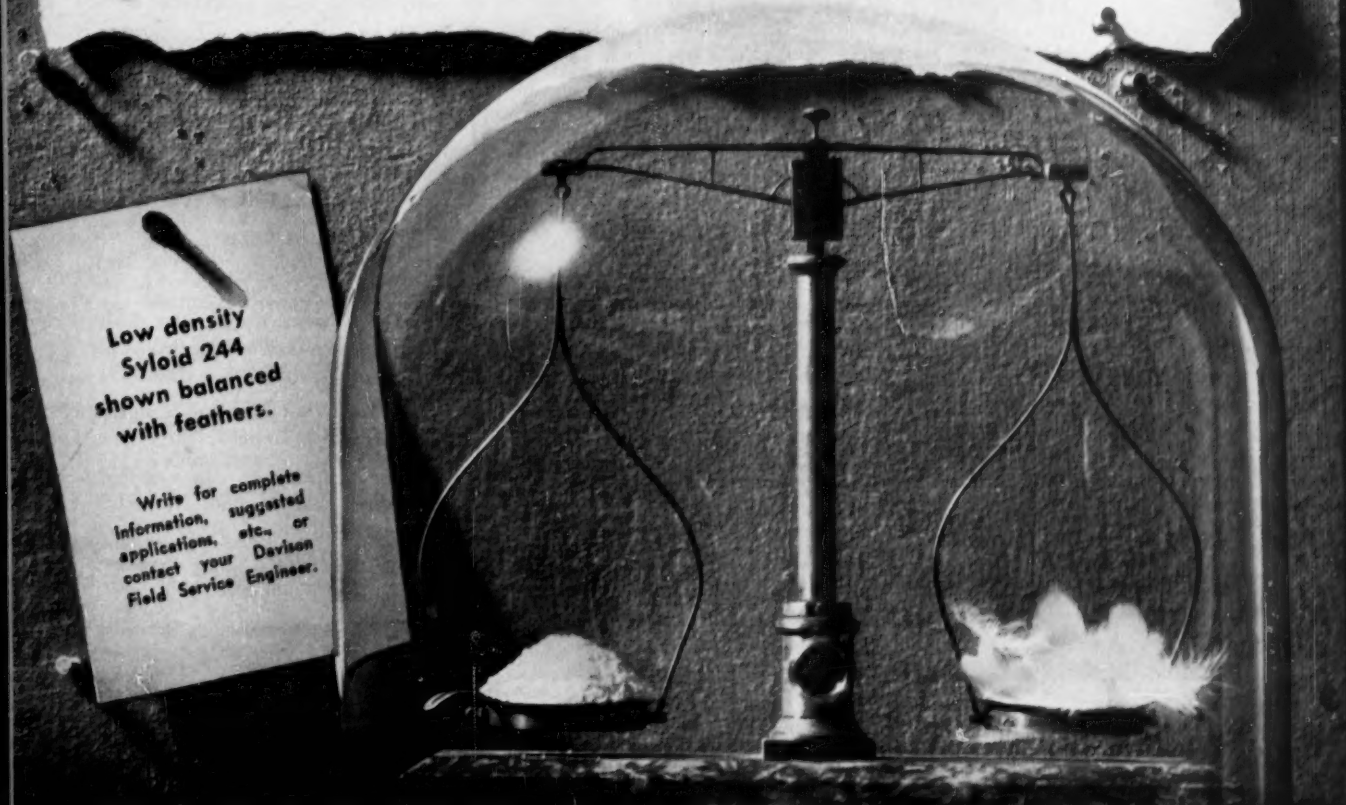
TYPICAL CHEMICAL AND PHYSICAL CHARACTERISTICS OF SYLOID 244

Color	**white, 94 Hunter reflectometer transparent in vehicles**
Appearance	**uniform, free-flowing powder**
Density	
as shipped	**4-4.5 lbs./cu. ft.**
centrifuged in toluol	**7.5 lbs./cu. ft.**
true (specific gravity)	**2.1-2.2**
pH	**7.2**
Silica as SiO_2 (dry basis)	**99.5%**
Oil adsorption	**240 lbs. oil/100 lbs. SiO_2**
Surface area (nitrogen)	**292 M_2/gram**

PARTICLE SIZE DISTRIBUTION BY WEIGHT

(water sedimentation)

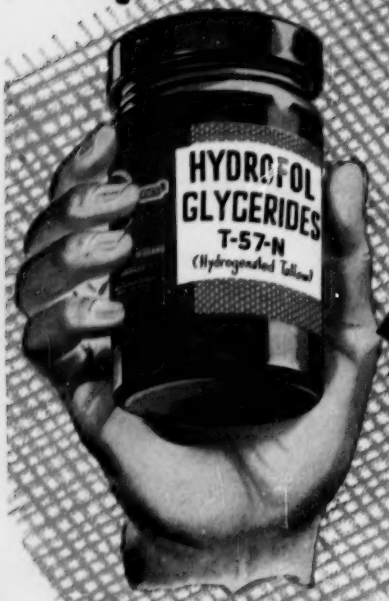
5% less than	**1.1 microns**
10	**1.4**
20	**2.0**
40	**3.0**
50	**3.7**
60	**4.5**
80	**7.0**



Specify HYDROFOL GLYCERIDES T-57-N

(Hydrogenated Tallow)

for highest quality



TEXTILES

HYDROFOL T-57-N is a superior glyceride with an extremely low free fatty acid content. It is perfectly suited to the manufacture of sizes, finishes, softeners, and other textile chemicals. If you have been searching for a hydrogenated tallow with low iodine value, pure white color . . . a tallow that will not turn rancid . . . write for a sample of HYDROFOL T-57-N today. Excellent, too, for Hot Melt Adhesives and Japan Wax replacements.

SPECIFICATIONS

FFA Max. as Oleic	0.5
Acid Number	1.0 Max.
Saponification Value	193-198
Iodine Value	1.0 Max.
Titre °C	57-61
Melting Pt. °C	59-64
Color Max. (5¼ inch Lovibond)	10Y-1R

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continuous Technical Information Service on latest developments in new ADM Chemifats. Furnished in handy file folder form for quick reference. A request on your letterhead will put your name on our Technical Information mailing list.



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ACIDS • GLYCERIDES • SPERM OILS • ALCOHOLS

FROM VEGETABLE • ANIMAL • MARINE OILS and FATS

PRODUCED IN ANY QUANTITY

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ARCHER • DANIELS • MIDLAND COMPANY

Chemical Products Division • 2191 West 110th St. • Cleveland 2, Ohio

Venture Southward

Before the end of 1955, Republic Steel Corp. (Cleveland) expects to be producing 2000 tons of rutile concentrates deep in a remote section of Oaxaca, Mexico. Company engineers and geologists have assayed up to 25 million metric tons of 15-20% rutile ore on two of the 38 claims to which Republic holds rights.

All plant construction will be handled by native labor; rutile concentrates will be shipped from Port Angel. Current plans involve no titanium metal venture, but Republic will "follow" all phases of titanium processing and fabricating work.

The biggest problem the company faces will be transporting equipment to the plant site from Port Angel. The deposits are only 35 miles inland, but must be reached by tortuous one-lane trails cut into mountains that rise 4-10,000 ft. high. (Diesel fuel must also be trucked to provide power for plant and mining operations; too, before shipments can start, Republic must rebuild current wharf facilities.)

Presence of rutile in the Oaxaca area has been known for years. U.S. government engineers, for example, reported the presence of ilmenite there in 1942. And engineers from a half dozen other companies have visited the section on exploration trips.

Republic is the first to obtain sufficient data to justify exploitation costs.

KEY CHANGES. . .

J. D. Hayes, Jr., to assistant general manager, and **John M. Martin** to director of operations, Explosives Dept., Hercules Powder Co., Wilmington, Del.

Frank Seeland, to manager, Insecticide Div., S. B. Penick & Co., New York City.

George L. Varnes, to executive director, Agricultural Products Div., Eli Lilly and Co., Indianapolis, Ind.

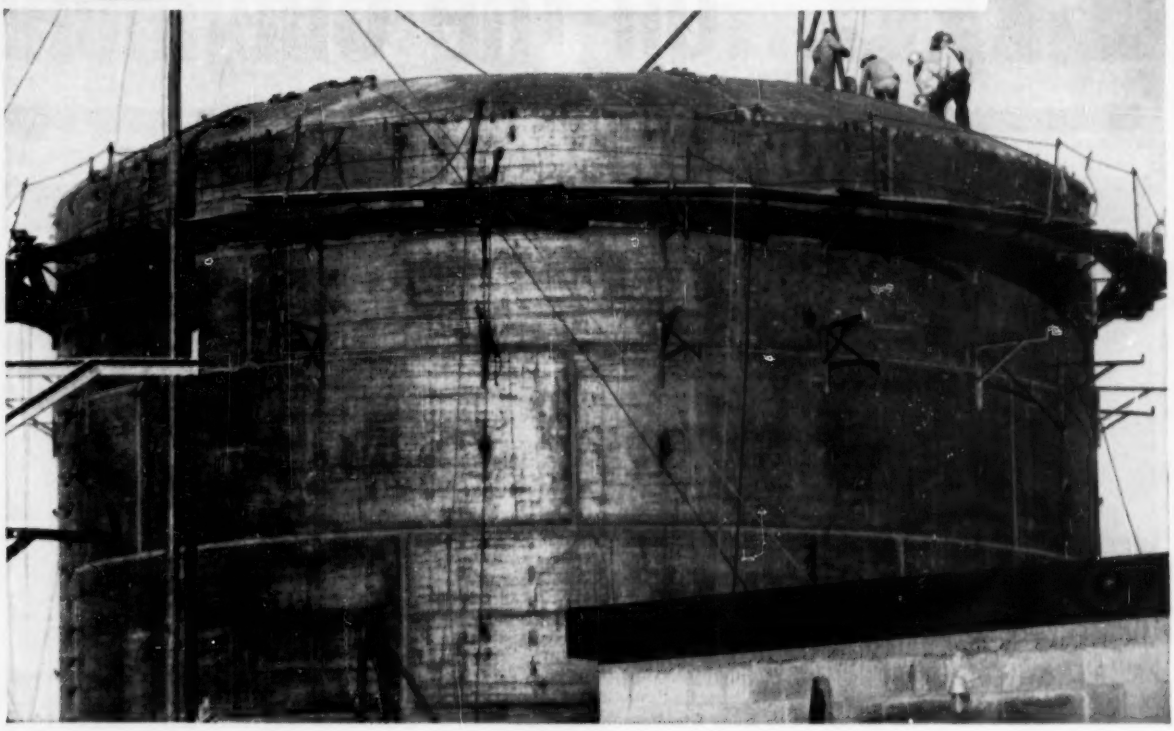
C. G. Grace, to president, Colgate-Palmolive, Ltd., Toronto.

Thomas P. Brown, to vice-president, Scientific Design Co., Inc., New York City.

Pierre S. du Pont 3rd, to secretary, Du Pont Co., Wilmington, Del.

C. W. Turner, to manager, Specialty Sales, Diamond Alkali Co., Cleveland.

GRAVER ... pioneer in FIELD ERECTION IN ALLOYS

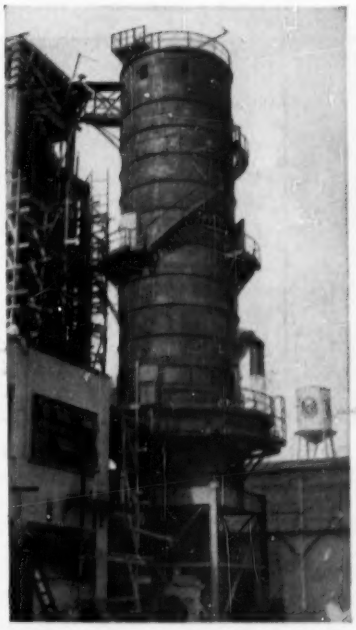


When Seeking a Source...

Consider the wealth of experience Graver has gained in field erection in alloys . . . experience that dates from the birth of alloys. It is standard procedure for Graver to build large, site-erected tanks, towers and process vessels of every size and description—like the large nickel-clad tank for storing caustic shown above, and the intricate spray tower on the right.

Both in this country and abroad, Graver has acquired a reputation for fine craftsmanship, plus a unique ability to more than satisfy customer demands.

For all industries—chemical, petroleum, food, pharmaceutical—Graver fabricates in nickel, stainless, clads and aluminum, as well as in carbon steels. Precision work, painstaking care, intensive inspection methods—these are integral parts of the Graver method. Taken together, they mark Graver as a source worthy of your consideration.



GRAVER TANK & MFG. CO., INC.

East Chicago, Indiana

CHICAGO • NEW YORK • PHILADELPHIA • EDGE MOOR, DEL • ATLANTA • CATASAUQUA, PA. • PITTSBURGH • CLEVELAND • DETROIT • TULSA • SAND SPRINGS, OKLA. • HOUSTON ODESSA, TEXAS • CASPER, WYO. • LOS ANGELES • FONTANA, CAL. • SAN FRANCISCO

Life...on the Chemical



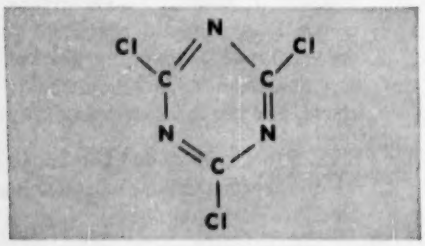
ACHROMYCIN FROM AUREOMYCIN—It looks simple here, but removing one chlorine atom from the Aureomycin* chlortetracycline molecule to produce Achromycin® tetracycline took years of research by many scientists at Lederle Laboratories. Dr. James Boothe, one of the chemists who worked on the problem, holds a three-dimensional atomic model of Aureomycin as Dr. J. H. Williams (right), Director of Chemical and Biological Research, removes the chlorine atom symbol. Dr. Nestor Bohonos, who heads Mycological Research, looks on. Achromycin is produced from Aureomycin by catalytic reduction at Cyanamid's Lederle Laboratories Division. *Trade-mark



SLALOMING at 70 mph and over demands superb skill, super qualities in skis. Top ski performance over dips and bumps, with low friction and no tip and tail flutter, are obtained with new plastic skis molded of Cyanamid's LAMINAC® polyester resin and glass fiber. High strength and extreme durability are combined with light weight and molded-in color to produce skis that never warp or need refinishing. (No. 2)



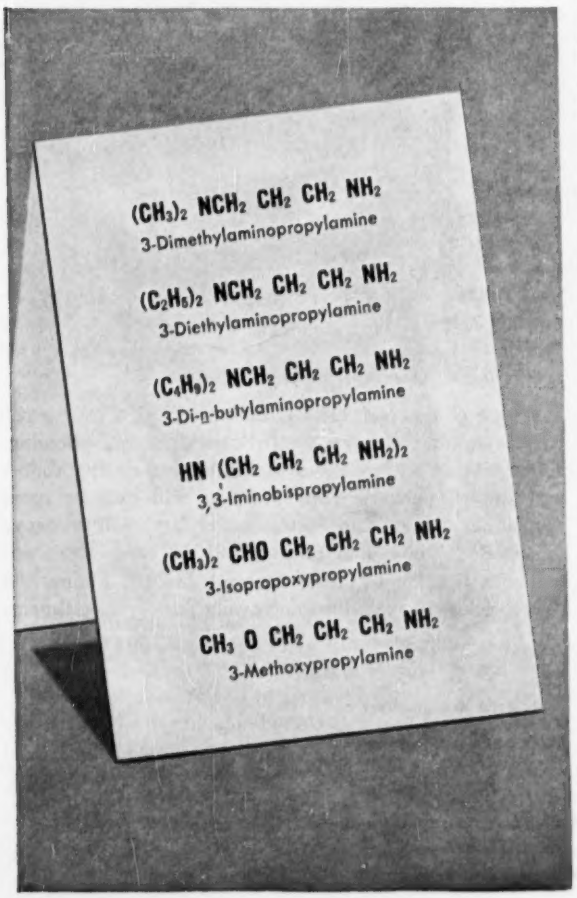
U. S. POPULATION is expected to pass 164,000,000 this month. This Department of Commerce "clock" records population growth minute by minute. Every 12 seconds there is one more mouth to feed! But there is no Malthusian dilemma—food abounds, thanks to good farm practice, development of new strains of plants and animals, and chemical aids for farmers. Cyanamid, long a major supplier of chemical aids to farmers, now produces anhydrous ammonia for direct application to soil, thus providing essential nitrogen at lowest cost per unit. Anhydrous ammonia is used also in mixed fertilizers. (No. 1)



CYANURIC CHLORIDE with its stable triazine ring structure and highly reactive chlorine atom on each carbon, offers interesting opportunities for organic synthesis. For example, the chlorines may be replaced with allyl groups to make triallylcyanurate—the basis for new plastics which retain much of their strength at temperatures as high as 500° F. Other cyanuric chloride derivatives are used as therapeutics and as bactericides. Still others produce brilliant dyes, and brighteners for detergents and textiles. When converted to cyanuric triazide, a brisant explosive is formed. It offers many other possibilities for further synthesis. (No. 3)

Newsfront

AMINES FOR NEW PRODUCT DEVELOPMENT listed below offer interesting possibilities. Stemming from Cyanamid's acrylonitrile, all are typical acrylo derivatives. Each has a propylamine group but varies in the other substituent, producing corresponding changes in physical properties. For example, as the substituent increases in size, vapor pressure decreases and solubility in non-polar solvents increases. Effect is seen in use as curing agents for epoxy resins where dimethylaminopropylamine provides rapid cure while diethyl and higher substituents offer greater pot life. These amines are useful in forming surface active agents. Cationics and nonionics are produced by reaction with fatty acids and have been employed as emulsifying agents for waxes and as flotation agents. The amines also are useful intermediates for products such as germicides, pharmaceuticals and dyestuffs. The New Product Development Department offers these amines in semi-commercial quantities. The only exception is the di-n-butyl derivative, which is available in trial-lot quantities. For data sheets, samples or price information on any of these amines, a coupon is attached for your convenience. **(No. 4)**



"Cogitations"

300,000 turkeys are estimated to have been lost last year by death from erysipelas. *Erysipelothrix rhusiopathie* is the culprit, which also produces the disease in swine and an erysipeloid infection in man. A new vaccine, DUOVAX® erysipelas bacterin *Lederle*, produced by Cyanamid's Lederle Laboratories Division, provides effective control of erysipelas in turkeys—with the added advantage that there is no danger of infecting vaccinator or the turkey houses as was possible with the former serum and culture type vaccine. **(No. 5)**

Anti-static agent CATIONIC SP is a boon to processors of materials such as textiles, plastics, paper, and glass since it is applied easily and eliminates troublesome static. Added to plastic compositions, it prevents accumulation of strongly adhering dust on the finished products. CATIONIC SP is one of a group of Cyanamid's surface active agents. These polar-nonpolar chemicals change the behavior of textiles, metals, oily materials, and fine powders by forming an extremely thin molecular layer on their surfaces. Usually, a very small percentage is all that is required. A Cyanamid surface active agent may be used to change the surface characteristics of a product easily, and improve its properties greatly. **(No. 6)**

The ultraviolet component of sunshine often causes discoloration and embrittlement in lacquers and plastics, checking and crazing in rubber, color changes in dyes and pigments, loss of strength in textiles, and blistering on tender skins. A small group of chemicals (substituted benzophenones) has been found to provide efficient protection against U. V. degradation. In particular, Cyanamid's U. V. ABSORBER 9, which is the 2-hydroxy-4-methoxy-benzophenone, is unusually effective. It absorbs harmful U. V. and converts it into harmless heat without fluorescence. New Product Bulletin #31, giving pertinent data regarding U. V. ABSORBER 9 and other related U. V. absorbers, is available on request. **(No. 7)**

More information on any of the products mentioned in these pages is available on request. Write to "Chemical Newsfront," American Cyanamid Company, 30 Rockefeller Plaza, New York 20, N. Y., or use the coupon below—simply checking the items on which you wish additional information.

AMERICAN *Cyanamid* COMPANY
30 ROCKEFELLER PLAZA
NEW YORK 20, NEW YORK

SEND more information on the following items mentioned in the January, 1955 issue of LIFE on the Chemical Newsfront:

C.W.

No. 1, 2, 3, 4, 5, 6, 7.
Literature ☐ Prices ☐ Sample ☐ of_____

Name_____

Company_____

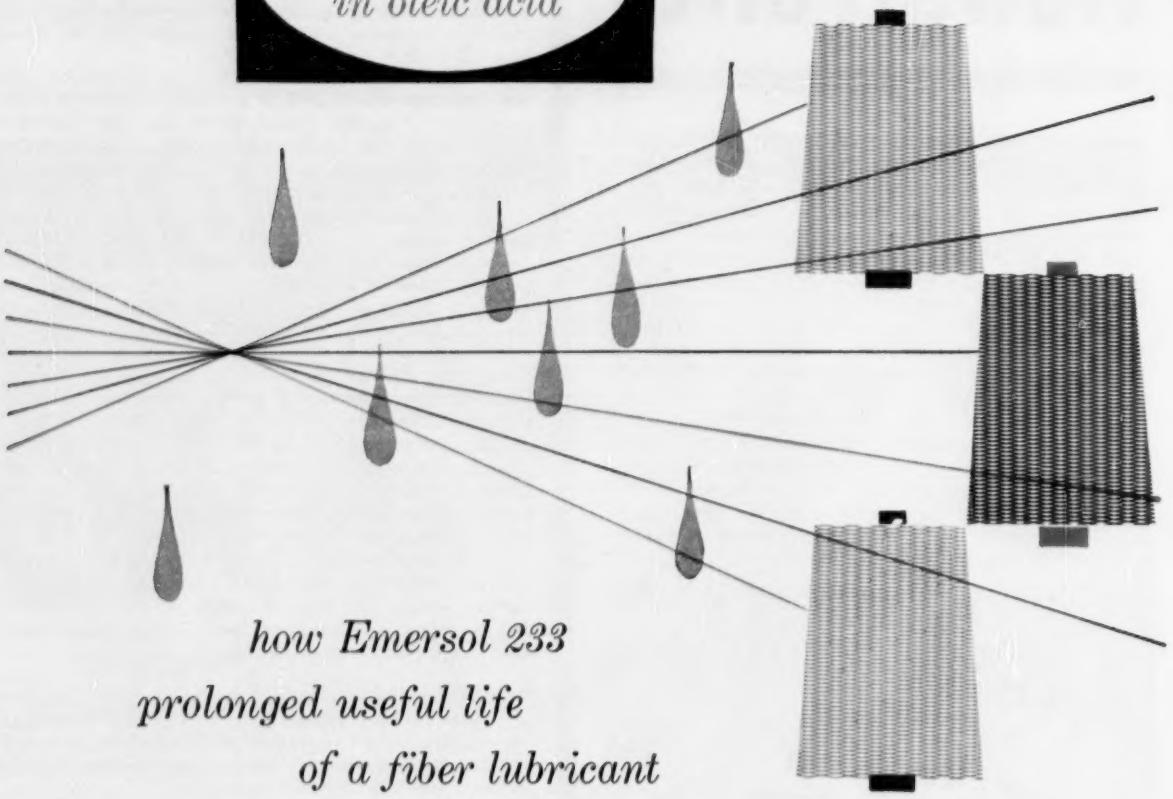
Address_____

City_____ Zone_____ State_____

spotlight on

aging stability

in oleic acid



how Emersol 233 prolonged useful life of a fiber lubricant

If you have problems with stability during storage of your product, then this customer experience may help you:

Case History No. 12-22 . . . A well-known manufacturer of rayon coning oils had long used Emersol 221 Low Titer White Elaine as a major ingredient because of its superior stability as compared to competitive grades. But, because as much as a year sometimes passes from the time the oil is applied to yarns and finally removed prior to dyeing, a search for the utmost in color and odor stabilities was inaugurated. This led to prolonged aging tests involving all high-quality oleic acids. On finding that the resistance to rancidity and yellowing of his coning oil made from 233 was better than that made from Emersol 221 and far superior to those compounded from double-distilled grades, he switched exclusively to Emersol 233. Thus, he obtained maximum assurance against product failure even after a long time delay, and against costly returns of below-par material.

Your use of Emersol 233 LL Elaine will give your product maximum resistance toward rancidity and yellowing, color stability and oxidation stability, even during abnormal storage periods. Your products will thus be more appealing, will stay appealing longer, and will be easier to sell. So . . . give your products all the competitive advantages possible by using Emersol 233 LL Elaine, the purest oleic acid available...and available only from Emery.

Emery

Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio

New York; Philadelphia; Lowell, Mass.; Chicago; San Francisco; Cleveland; Ecclestone Chemical Co., Detroit
Warehouse stocks also in St. Louis, Buffalo, Baltimore and Los Angeles
Export: 5038 RCA Bldg., New York 20, New York

Forecast for '55

This is what you can expect: a good year—but a tough one. That's the way *CW* sizes up 1955. It's the year when productive capacity will reach a staggeringly impressive new high; when sales will be robust but competition keen. It's going to be a year fraught with problems—problems of trimming costs, spurring research, developing both men and management methods. And as always, there will be the perennial tribulations of taxes and tariffs. It will be a year of challenge—big and demanding challenges. Among the most significant are those cited here by eight of the industry's leaders:

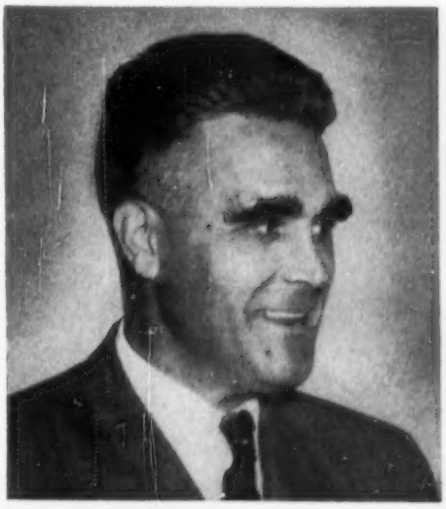


"The challenge to the chemical industry, in my opinion, involves increased acceptance of responsibility by management.

"We must set our house in order—to get our costs down and our profits up. To attain the efficiency required, management must analyze and re-evaluate its traditional ways of doing things. It must take initiative and responsibility for seeking change rather than resisting it.

"An enterprise must provide security of opportunity for its employees. The only means of assuring such a security of opportunity is a steadfast skill in increasing efficiency in all levels of management.

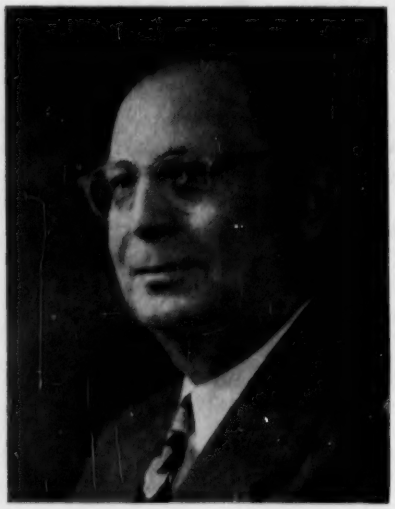
"Our responsibility extends more heavily now than before to the communities in which our industry operates. In addition to working with genuine determination to make our plants more attractive and desirable from the viewpoint of looks and wastes, we owe our communities the economic security that only a well-managed enterprise can offer."—**A. P. Beutel,** *vice-president, Dow Chemical Co.*



"What I consider the greatest challenge the chemical industry faces in 1955 is the vital need for a continuing flow of qualified personnel to man the highly technical positions in a complex industry. It behooves industrial and educational leaders to take inventory of this situation and lay plans to encourage a larger proportion of students enrolled in colleges and universities to train for the many technical and engineering operations required by the chemical industry.

"This situation is thrown into sharper focus by the increasing needs of industry. Current business trends clearly indicate near capacity operations in substantially all lines during 1955. As the chemical industry is the only industry serving all basic industry groups, it must assume the responsibility of anticipating demands for chemicals required by new developments in many fields both civilian and military."—**Frank Soday,** *president, The Chemstrand Corp.*

Forecast for '55



"The greatest problem facing our industry—and one that should be tackled with all the intelligence and ingenuity we possess—is that of increasing the enrolment of young men and women in science and technical courses.

"Our fast-growing industry will demand a much larger number of technically trained people to carry on management, research, production and selling. Nonetheless, the number of students taking scientific courses in our educational institutions is far below our future requirements. This condition, if it continues, will not only stifle progress but will also endanger our national security.

"Young people and their parents should be informed and shown the great opportunities that are available to graduates in science . . . the great and interesting future before them."—**Rothe Weigel**, *president, Victor Chemical Works.*



"The nitrogen industry, in particular, faces this challenge: transition from a situation of tight supply to one of surplus production. This has been anticipated for at least three years, but the development of new capacity has exceeded initial estimates. (Last summer, U.S. nitrogen production reached 2.69 million tons, is expected to be 3.04 million tons by this July.)

"The new situation indicates excess capacity of 300,000 tons by spring, rising perhaps to 450,000 tons by 1957 before beginning to taper off.

"The industry will experience stiffer competition; the ingenuity of research, and the vigor and skill of sales effort will be severely tested."—**Kenneth Spencer**, *president, Spencer Chemical Co.*



"The chemical industry must accept and measure up to the unsought responsibility that has been thrust upon it. That's the great challenge for 1955 .

"Our industry is now one of the fastest-growing segments of the nation's economy. Our nation—and the world at large—is in a state of change. Chemical developments have caused and promoted that change; we, therefore, must assume multidimensional responsibilities within and without the industry.

"We must clean up our own house of problems in distribution, personnel, production and economics. Based on a solid foundation of knowledge we must sow seeds for future growth. And with bigness in size, our industry must become truly 'big' in both thought and action.

"Humility is a sign of greatness. We would not err in its cultivation." — **Edwin Cox**, *vice-president, Virginia-Carolina Chemical Corp.*



"In 1955, our job is to market profitably all the capacity currently available or about to become available.

"To continue the growth the public has come to expect of us, the chemical industry must look for both new products and new markets. These will come from our industry's laboratories and market research groups, backed by sound conservative planning on the part of management."—**Hugh Ferguson,** *president, Dewey and Almy Chemical Co.*



"While the outlook for general business activity is encouraging and brighter than a year ago, the chemical industry will see intensified competition in research, product development, and sales.

"With the production capacity the industry will have in many lines as a result of the completion of mobilization goals, there will be added incentive to develop new end uses and broaden markets.

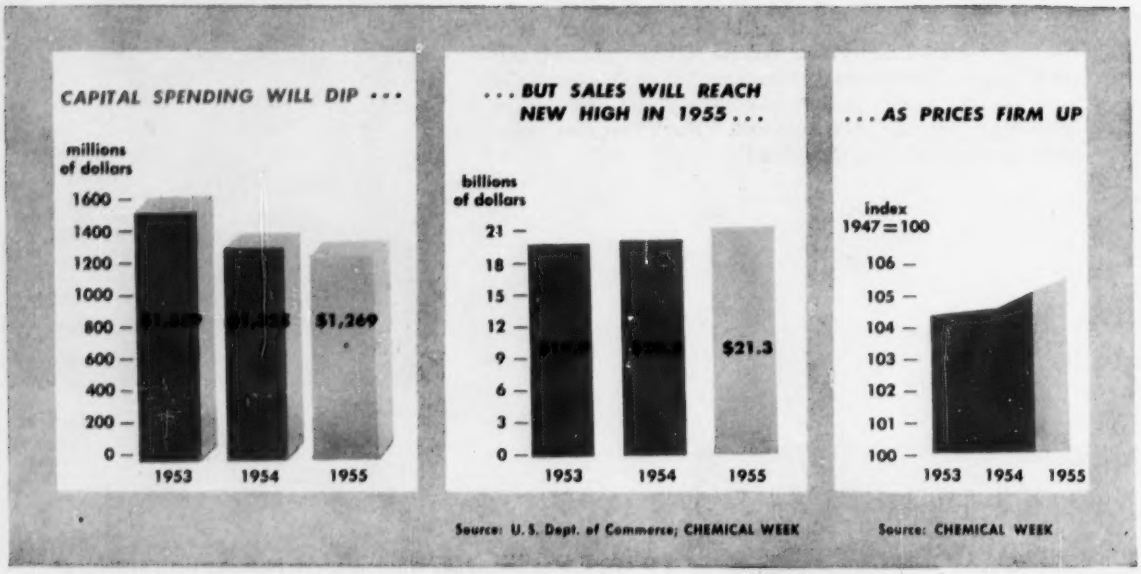
"On the whole, conditions seem favorable for a resumption of high levels of activity for most chemical products."—**Fred Emmerich,** *president, Allied Chemical and Dye Corp.*



"Chemical business, as 1954 ended, was on a definite upswing. The most significant challenge in 1955 is to extend that upswing into new high ground.

"The chemical industry in general, and the production of chemicals from petroleum in particular, have long been characterized by dynamic growth. Typically, this growth is exponential in nature and great in magnitude. The inventory 'recession,' which our industry has undergone, can and will be shown to be a minor aberration."—**George Parkhurst,** *board chairman, Oronite Chemical Co.*

Forecast for '55



Better Business, Brighter Outlook

IT'S almost impossible to find anyone in the chemical industry today who isn't optimistic over the business outlook in the months ahead. Though most manufacturers are predicting a 4% drop in capital spending, chemical sales are expected to increase 5-6% in 1955.

This confidence stems from a number of favorable omens: current sales are inching upward; few, if any, customers harbor inventories of any substantial significance; and increased industrial activity throughout the nation invariably means expanded markets for chemicals.

But almost to the man, chemical executives agree that this year won't be all beer and skittles. Nearly all are girding for a rough, tough competitive tussle. They scent a battle looming—both to hold on to present contracts and to snare others.

Making It Official: Eisenhower's new policy toward business will underline this switch in economic thinking. Instead of stressing plans to ease a slide-off in business in his annual report to Congress next week, he'll tell the joint session how he thinks the current improvement can be maintained.

The Administration apparently is now assured that the business pickup that first became noticeable in September is real and not ephemeral. It's scrapping plans designed to give the economy a quick stimulant. The upturn, moreover, will be interpreted as a vindication of Eisenhower policies to date, that should result in pressuring for implementation of such business influencers as:

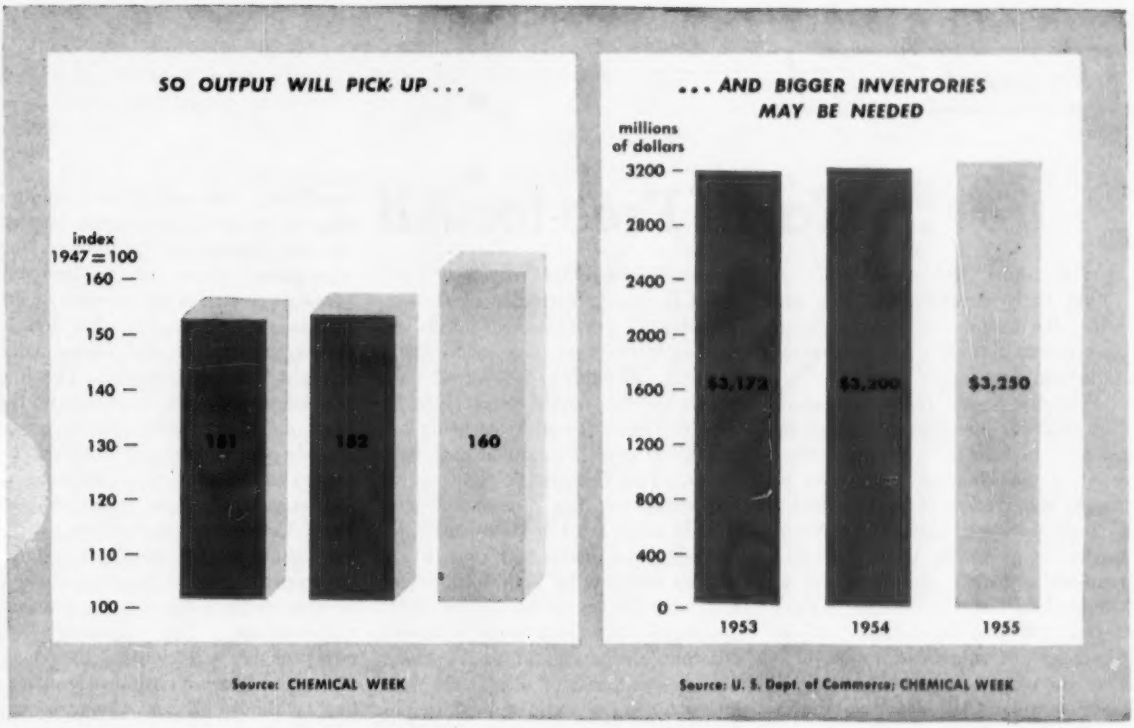
- Money will be kept fairly easy—calculated to keep the expansion boom rolling.
- Private housing will be encouraged. Government officials hope that housing starts this year will be around the 1-million mark—possibly up to 1954's 1.2-1.3 million.
- State and local governments will be encouraged to keep on borrowing for public works. A rise of at least $2 billion in nonfederal public work spending is the prospect.
- Eisenhower will ask Congress to approve an increase in federal spending for roads, plus establishment of federal agency to whet state and local participation.
- Export-import trade will be expanded. The Administration expects backing from the new Congress to extend reciprocal trade agreements (see p. 32), and Treasury Secretary Humphrey, who held out for a long time against foreign loans, has finally approved the plan for a new International Finance Corp.

Eisenhower's economists think these policies will offset any further decline in federal spending as well as compensate for the dip in business spending for new plants and equipment.

Currently, the mood is one of caution, not of worry.

Chemical companies' building plans, for example, indicate that capital spending a year from now will be higher than today. Nearly two-fifths of the companies polled in a recent McGraw-Hill survey of chemical manufacturers say they plan to boost expenditures in 1956 over 1955. (Past surveys have shown that such long-term preliminary plans are inclined to underestimate, rather than overestimate spending figures.)

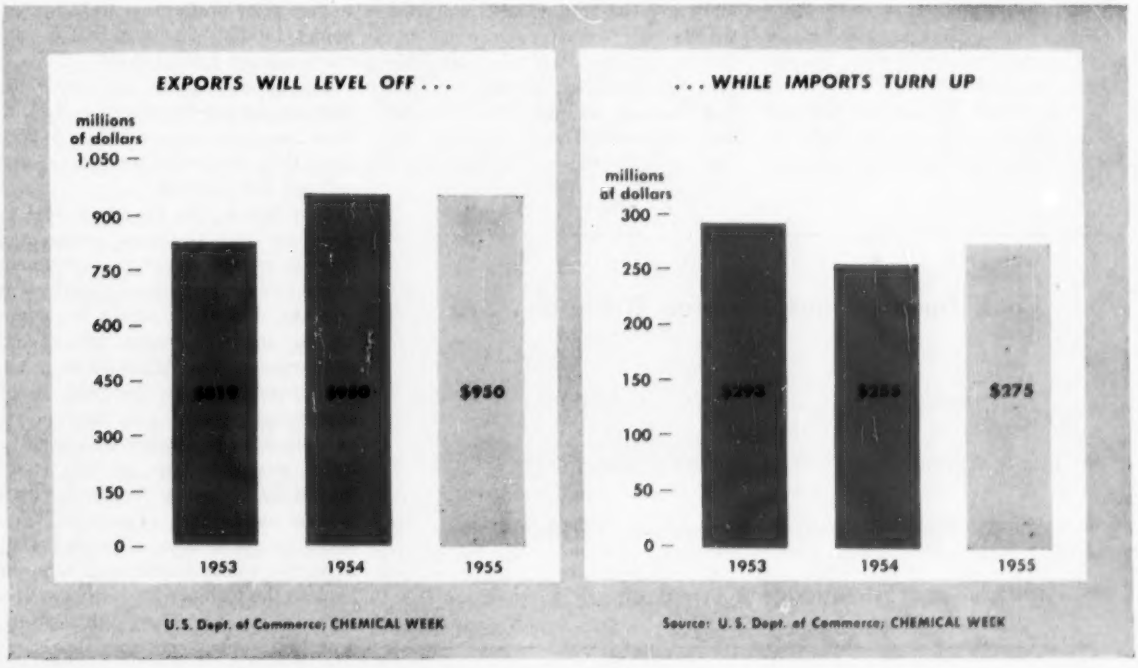
Too, the poll shows, increased levels of output suggest that chemical firms may build up inventories during the year ahead. (Bigger inventories in chemical producer's hands would not



be out of line with the historical inventory-to-sales ratios of the chemical industry, if sales continue at record-breaking levels throughout 1955.)

One lingering doubt mars the 1955 outlook: Because of the improved export situation in 1954, many producers registered better sales than had been expected, and that certainly won't be the case in 1955 if the current U.S. attitude on tariffs remains as is. Partly, at least, some foreign markets for U.S.-produced chemicals are bound to be cut off; and foreign competition in export markets may be more rugged.

An increase in over-all industrial activity should offset this drop in foreign sales in all but a few cases. Barring some unforeseen change in world affairs, 1955 should go down as one of the all-time peak years in the industry.



Forecast for '55

Tariff Free-for-All

THE ticklish problem of tariffs will get early consideration this year when the Eisenhower Administration presents its foreign trade program to Congress.

First, the 3-year Trade Agreements bill, customs simplification, tax concessions to foreign investors, ratification of the General Agreement on Tariffs and Trade will be presented as a single package. Then, "Buy American" rules governing bidding on government contracts are slated for an overhaul in favor of foreign bidders; multilateral tariff negotiations with the Japanese are scheduled to start (in February); and a major effort will be made to amend last year's antidumping legislation.

Chances are good for positive action on most of the measures in the President's trade liberalization program requiring Congressional approval. The main thing that stalled the program last year was control of key Congressional committees by high-tariff-minded Republicans. The Democrats who will run these committees this session are pledged to act faster on all trade measures.

Here's the outlook now for major items in the President's trade liberalization program:

- The Trade Agreements bill will be submitted to the House Ways & Means Committee this month in much the same form as last year. It will call for a three-year extension of the act, Presidential power to cut tariffs reciprocally 15% over three years, power to reduce all tariffs to 50% ad valorem, power to cut tariffs reciprocally by 50% of 1945 rates on items being imported in negligible quantities. Rep. Jere Cooper, Democratic chairman of the committee, has promised to put the bill at the head of his calendar.

There's no doubt that such a bill will be attacked by both "protectionists" and "freer-traders." Some Congressional Democrats want to knock out the "escape clause" under which U.S. firms injured or threatened with injury by imports can appeal to the Tariff Commission for tariff relief. Protectionists, on the other hand, will seek to broaden the escape clause to make it easier for U.S. firms to get more protection. They'll also try to load the bill with restrictive amendments (by writing strict quotas on imported oil, e.g., into the bill). Independent oil producers should be especially outspoken.

But despite verbal fireworks, it looks as if the protectionists and freer-traders will cancel each other out. Result: Congress will give the President the legislation he asks for.

- Customs Simplification: The Administration will push again for passage of the Jenkins bill—aimed at simplifying the method of evaluating imports for duty assessment. Imports are now assessed on the basis of "foreign value," which requires time-consuming research in the country of origin to determine. This has led to delays, uncertainty, and, occasionally, outright losses to importers. The Jenkins bill would evaluate imports on the basis of "export value," which can be quickly determined and would be known to the exporter in advance.

Last year, Congress authorized the Tariff Commission to conduct a two-year study of the whole U.S. tariff structure in order to recommend ways of simplifying it by merging customs classifications. The Administration now probably will try to get the power to carry out such a customs simplification without further Congressional authorization.

- Tax concessions to foreign investors: this looks more like a tossup, will rally more Republican and less Democratic support than the other parts of the legislative program, may get lost in the shuffle.

- The Administration has dropped plans to seek Congressional Amendment of the "Buy American" Act of 1933. This requires the government to give price preferences to U.S. companies bidding for government contracts against foreign firms.

No specific price differential is stated in the law but traditionally U.S. firms have been able to bid up to 25% more than the lowest foreign bid and still get the contract.

Last March, the President tried to wipe out "Buy American" preferential bidding except where unemployment in the U.S. or the national security was at stake. But there was a big jump to be made between effort and achievement. The Administration has been wrestling with the problem of how to put teeth in its new policy ever since. In November, an executive order was slated to go into effect drastically reducing the preferential margin under "Buy American." But under pressure from interested U.S. firms the whole matter was referred back to the Cabinet for further study.

Odds are, however, that "Buy American" policy will soon be liber-

Look for an Administration Drive to . . .

Strengthen	Amend
• Trade Agreements	• Buy American
• Customs Simplification	• Japanese Tariffs
• Foreign Tax Concessions	• Antidumping Legislation

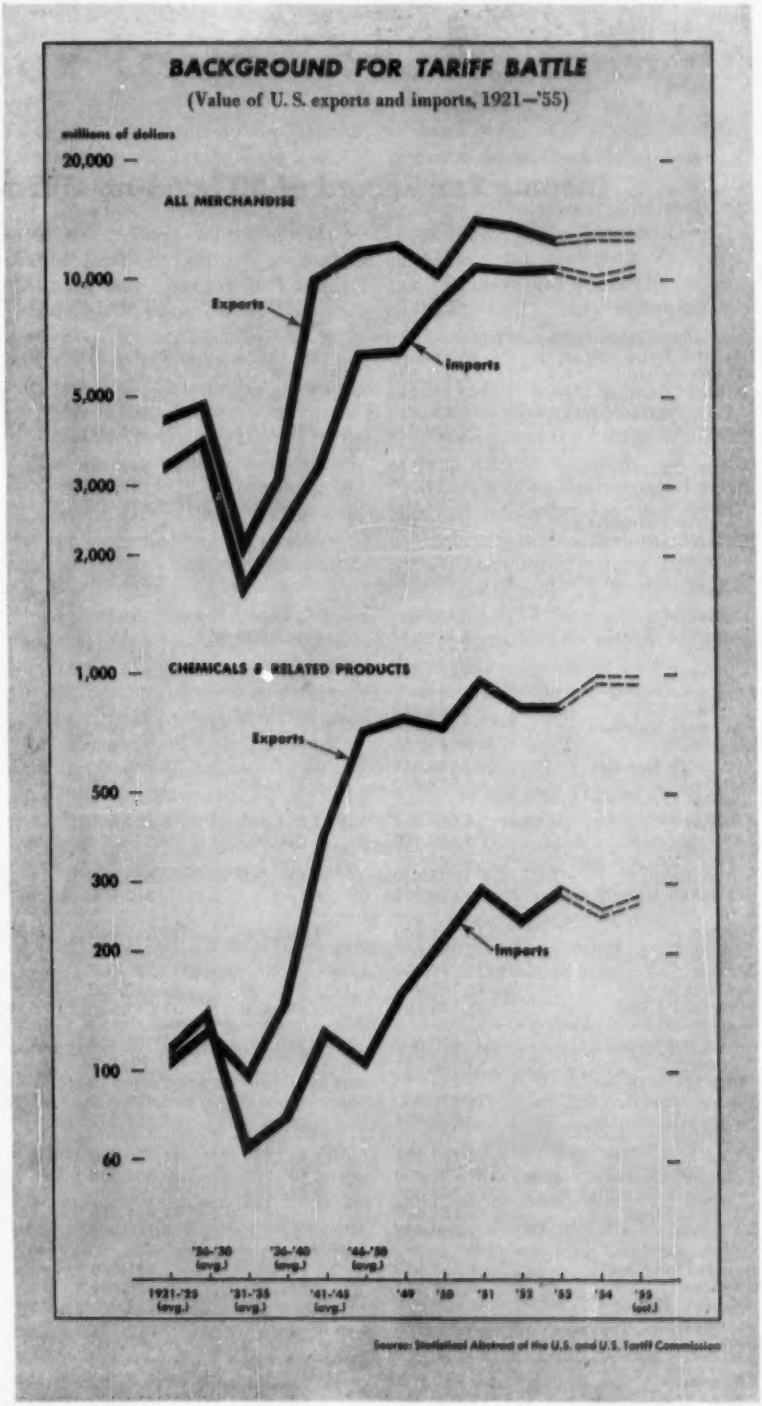
alized by the White House to a large degree. Pointing the way: a number of contracts have just recently been granted to foreign firms—bids that were as little as 12% below the lowest U.S. bids.

• The Japanese tariff negotiations scheduled to begin in February will be the first big tariff-cutting session since 1951. The U.S. not only will grant tariff concessions to the Japanese on a reciprocal basis but will also encourage other nations to let Japan into their markets by granting them U.S. tariff concessions. Once the negotiations are completed, Washington will push to get Japan admitted to GATT as a full member. This would give the Japanese the benefit of all the tariff reductions negotiated within GATT since the war under the most-favored-nation clause of the GATT.

• Keystone of the Administration's trade program in 1955 will be the effort to strengthen GATT and have it ratified by Congress. GATT was set up in 1947 as the central control mechanism of free-world trade; member nations together conduct over 80% of the world's trade. And while its primary purpose has been to set down rules for the conduct of world trade governing export subsidies, import restrictions, discriminatory taxes on imports and exports, etc., it also has provided the framework within which all tariff cutting has been accomplished since the war.

The conference now under way at Geneva is designed to tighten up world trading rules and to strengthen the machinery of GATT. Eisenhower, therefore, is virtually committed to submit the new treaty to Congress for approval. (The U.S. has been participating in GATT in the past under Executive authority. Congress has refused to approve participation explicitly, which has weakened its authority.)

Failure by the Administration to push GATT through Congress this year would strike a blow at the nerve center of the reciprocal trade program. An outright turndown by Congress could smash the whole structure of trade agreements built up since the war, and start U.S. tariff back toward the record levels of Smoot-Hawley days. Approval of GATT, on the other hand, would virtually assure a continued slow reduction of U.S. trade barriers.



That means that although it's too early to predict which way Congressional opinion on GATT will veer, protectionists will fight hard against ratification on the ground that it violates the constitutional right of Congress to set tariff policy by giving over control to an international organization. Net result: the GATT issue could well be the hottest trade issue Congress will have to deal with in 1955.

Income Tax Record of 50 Leading Chemical Companies

Company	1952 Total	1952 EPT	1953 Total	1953 EPT	1954 (first nine months)	
Abbott Labs	$6,611,658	$cr183,888	$8,000,000		$ 6,310,579	
Air Reduction	8,981,536	879,677	6,997,676		4,945,035	
Allied Chem. & Dye	40,111,963	2,900,763	32,278,494	cr452,932	33,245,683	
Amer. Agricultural	4,100,000		4,300,000		3,900,000*	
Amer. Cyanamid	20,000,000	cr2,900,000	25,000,000		19,300,000	
Amer. Potash	671,000		775,000		731,500	
Atlas Powder	2,219,000	100,000	3,357,000	475,000	2,014,000	
Blockson	4,902,000	888,000	5,430,000	990,000	3,192,000	
Colgate-Palmolive	9,786,162		9,675,314		7,460,648	
Columbian Carbon	2,650,000	cr150,130	3,130,000		2,375,000	
Commercial Solvents	946,600		2,325,000		1,618,200	
Davison*	2,427,663	270,000	2,809,567		Merged with W. R. Grace May 1954.	
Diamond Alkali	5,199,342	cr568,000	5,281,237	cr634,000	4,505,571	
Dow[1]	73,700,000		45,200,000	5,500,000	24,400,000	cr3,700,000
Du Pont	369,680,000		404,840,000		194,570,000	
Ferro	1,328,918	68,000	1,645,930		1,249,013	
Freeport Sulphur	1,836,000		2,250,000		NA	
Glidden[2]	7,255,000		7,725,000		4,816,000	
Hercules Powder	20,898,311		19,656,942		12,421,275	
Heyden	1,082,000	cr351,000	1,260,000		535,206	
Hooker[3]	4,580,000	1,255,000	3,764,600	175,000	3,352,000	
Interchemical	4,430,000	810,000	4,850,000	987,000	2,878,000	
Inter. Min. & Chem.*	3,025,000		2,850,000		1,070,000	
Inter. Salt	3,235,000	665,000	2,565,000	410,000	1,669,114	
Jefferson Lake Sulphur	580,000		512,000		651,900	
Koppers	12,345,000	1,685,000	15,065,000	2,410,000	6,059,435	
Liquid Carbonic[4]	2,050,000		2,465,000		2,855,000	
Merck	pf15,040,000		pf13,300,000		10,651,000	
Monsanto	19,702,000	cr1,614,000	22,813,000	247,000	14,773,174	
National Lead	25,326,109	4,150,000	33,245,601	4,919,000	23,340,999	
Newport Ind.	670,000	cr362,997	735,500		281,000	
Nopco	1,413,721		1,795,509		1,054,900	
Olin Mathieson	not available on pro forma basis				23,655,327	
Parke, Davis	16,450,000	175,000	8,400,000	cr175,000	6,979,000	
Pennsalt	3,073,904		3,287,819		2,395,717	
Pfizer	10,123,275	cr1,420,000	11,700,000	250,000	7,827,378	
Pitts. Pl. Glass	37,600,000	2,500,000	37,800,000	1,500,000	26,958,106	
Procter & Gamble*	44,364,000	2,636,000	38,760,000	450,000	51,128,000	3,022,000 (EPT)
Rohm & Haas	10,114,000		12,998,000		11,363,000	
Schering	1,900,000		1,760,000		1,236,000	
Smith-Douglass[5]	1,950,500	102,000	2,487,000	175,000	2,300,000	35,000 (EPT)
Spencer*	6,428,000	721,300	5,826,000	465,000	5,713,000	
Spencer Kellogg[6]	1,100,000		172,000		2,850,000	
Stauffer	3,203,969	cr182,035	4,735,000	25,000	3,615,000	
Sterling	14,350,000		14,800,000		11,400,000	
Tennessee Corp.	5,250,000	825,000	7,300,000	1,570,000	5,115,000	
Texas Gulf Sulphur	13,500,000	450,000	15,750,000	1,450,000	11,811,000	
Union Carbide	128,987,704		124,976,459		57,238,884	
Victor	2,800,000	12,000	4,020,000	495,000	2,656,000	
Virginia-Carolina*	4,693,000	455,000	3,555,000	72,000	2,855,000	93,200 (EPT)

* Full year taxes, fiscal year ends June 30.
(1) Year ends May 31.
(2) Year ends Oct. 31, therefore first nine months of 1954 is period ending July 31.
(3) Year ends Nov. 30, therefore figure for 1954 is full year's taxes.
(4) Year ends Sept. 30, therefore figure for 1954 is full year's taxes.
(5) Year ends July 31, therefore figure for 1954 is full year's taxes.
(6) Year ends Aug. 31, therefore figure for 1954 is full year's taxes.
Key: cr, credit; pf, includes taxes paid by merged companies on pro forma basis; EPT, excess profit tax.

Tax Tangle: No End in Sight

NOBODY knows more realistically than chemical companies just what heavy taxes can do to evaporate corporate earnings. High in excess profits brackets, many of the nation's largest chemical producers have struggled with the problem of staggering taxes and have sought—in vain—for some relief since the end of the Korean War.

Problems of individual income taxes have snarled pension plans, interfered with stock bonuses, caused turmoil at high executive pay levels. Attempting to placate themselves and their employees, most companies have long adopted the "wait-until-next-year" theme and resigned themselves to accepting the burden until the Eisenhower Administration was able to get into gear.

Much of the thinking behind the dip in capital expenditures involved the thorny problem of taxes; many companies openly admitted they were waiting for lower taxes before launching new expansions.

In the opinion of many leading economists, 1955 was to be the year of reckoning. Everyone hoped (or said he hoped) that on top of the $7-billion-plus tax relief handed to taxpayers by the 83rd Congress, sweeping tax reforms would be made.

There's very little likelihood now, however, that such relief will come. Unless there is an unexpected downturn in business during the first six months of the new year, there's very little chance of further tax cuts.

At least, the Administration is due to ask for none, and, in the absence of a recession, the Democrats (politically speaking) would profit more by waiting a year to press for tax drops—a year in which the argument for tax relief could be used in a Presidential campaign.

Some Cause for Cheer: In certain areas, there may be attempts made to ease the tax pressure a bit. Just how much and where is open to conjecture—but the general shape of things to come is clearly evident.

It now looks as though the reduction in corporate tax rates (scheduled to take effect in April) will be postponed at least another year. The 83rd Congress extended the 52% rate at the request of the President; the 84th in all likelihood will do the same.

Here's the evidence:

- Eisenhower's closest economic advisers are stressing the strength of the current business rise, and point out that a corporate tax cut isn't needed to stimulate business.
- Sen. Prescott Bush of Connecticut, a spokesman for Treasury in the past, has warned business not to expect major tax reductions "too soon."
- Top Treasury officials privately are saying that—while a decision rests upon the changing economic climate—they sorely need the revenue, and will recommend retention of the present rate unless something unexpected develops.

The same general hold-the-line theme will undoubtedly be extended to include excise taxes. Reductions are due also in April under existing law, but there's little chance that they won't be rescinded.

Why: the 83rd Congress forced one set of excise tax reductions down the Administration's throat—despite a fight led by Treasury Secretary Humphrey. Chief selling point: that the move would bolster business, then at the end of a year-long slide.

That argument doesn't hold now though; and the government's need of revenue will supersede the "business prop" idea. Result: Congress will probably give Eisenhower what he wants.

The question of taxes on income earned abroad is another question. Eisenhower seems sure to press for a reduction of 14 points in the top rate as he did in his original tax reform bill presented to the 83rd Congress. It's an important part of his broad program to stimulate foreign trade, and was said to have been dropped mainly because of difficulties over language—rather than because of any disagreement with the principles involved.

If this was true, adoption by the 84th Congress seems assured, because technicians have had six more months to work on it. If, on the other hand, Republican protectionists were really the cause of its defeat, credit for income earned abroad may be in for a fight.

Possible repeal or expansion of the dividend credit on personal income is another sticky question.

It's plain though that dividend credit on personal income is the weakest part of the tax revision bill politically speaking, and therefore the most likely to be dropped.

If Congress' Democratic leadership decides to attack it, the dividend provision can be given no better than a 50-50 chance of survival.

Capital gains tax reduction is slightly more possible, however.

Treasury officials want very much to see this lowered. They believe the present rate gives a harmful rigidity to the economy, blocking sales and exchanges of property, which—if made—would have a stimulating effect.

But it's politically touchy. It gives tax relief to the "rich"—to those who own property, instead of to those who work for wages.

There is a slim chance that the Administration will try to sell a capital gains tax cut next year as an offset to extending present corporate income tax rate; hit business by extending the income tax, then do something for business by lowering the capital gains tax, in one package. So far, this idea hasn't picked up many supporters inside the Administration. It can't be ruled out, though.

Finally, chemical companies can look for no further loosening of depreciation rules in the new year. But Treasury officials are still working on a revision of the recommended table of "useful lives" for property. The revision—if adopted—will allow quicker depreciation by allowing taxpayers to estimate shorter useful lives on many types of production equipment—as such should profit company coffers to some degree.

Changes in the law exempting cooperatives from income taxes are still a long way off, as are possible tax recommendations for relief for persons making payments into private pension funds.

In all, it looks like a year in which there won't be much relief, taxwise, for chemical firms. If anything, the changes will be in kind—not in degree—of taxation.

Forecast for '55

Growth Record of 50 Leading Chemical Companies

(in millions of dollars)

Company	Sales			Net Profits			Profits as Percent of Sales	
	1947	1953	1953/1947	1947	1953	1953/1947	1947	1953
Abbott Labs.	$59.62	$88.73	149%	$10.22	$9.22	90%	17.1%	10.4%
Air Reduction	85.52	131.41	154	5.70	6.77	119	6.7	5.2
Allied Chem. & Dye	365.94	545.56	149	30.31	45.17	149	8.3	8.3
Amer. Agricultural	41.13	61.34	149	4.30	4.05	94	10.5	6.6
Amer. Cyanamid	214.58	380.39	177	9.16	27.47	300	4.3	7.2
Amer. Potash	13.64	22.46	165	2.11	2.12	100	15.4	9.4
Atlas Powder	41.24	58.79	143	2.02	2.23	110	4.9	3.8
Blockson	8.19	27.78	339	1.25	3.02	242	14.0	11.0
Colgate-Palmolive	259.40	257.39	99	19.01	12.04	63	7.3	4.7
Columbian Carbon	41.11	52.20	127	6.06	5.20	86	14.8	9.9
Commercial Solvents	54.98	51.58	94	9.07	2.66	29	16.5	5.1
Davison	25.44	56.59	222	1.81	2.93	162	7.1	5.2
Diamond Alkali	40.22	86.73	216	4.55	5.94	131	11.3	6.8
Dow	130.43	430.39	330	12.73	35.86	282	9.8	8.3
Du Pont	795.54	1,765.43	222	120.01	235.57	196	15.1	13.3
Ferro	27.74	39.34	142	1.27	1.55	122	4.6	3.9
Freeport Sulphur	20.18	48.55	241	3.11	8.54	275	15.4	17.6
Glidden	185.75	211.76	114	13.76	7.11	52	7.4	3.4
Hercules Powder	131.27	190.20	145	12.93	11.68	90	9.9	6.1
Heyden	21.91	23.48	107	2.72	1.24	46	12.4	5.3
Hooker	20.19	38.69	192	2.19	3.38	154	10.8	8.7
Interchem.	71.66	90.83	127	3.11	2.73	88	4.3	3.0
Inter. Min. & Chem.	41.30	88.84	215	3.83	7.03	184	9.3	7.9
Inter. Salt	13.12	21.49	164	1.63	2.23	137	12.4	10.4
Jefferson Lake Sulphur	3.14	8.08	257	0.38	1.49	392	12.1	18.4
Koppers	162.46	269.50	166	6.17	9.03	146	3.8	3.3
Liquid Carbonic	40.72	50.59	124	2.00	1.94*	97	4.9	3.8*
Mathieson	24.63	243.58	989	2.93	18.24	623	11.9	7.5
Merck	68.30	160.00	234	6.50	11.39	175	9.5	7.1
Monsanto	143.40	340.62	238	15.56	26.39	170	10.9	7.7
National Lead	268.03	436.05	163	12.18	30.85	253	4.5	7.1
Newport Ind.	15.43	18.07	117	2.59	0.73	28	16.8	4.0
Nopco	18.49	19.80	107	0.70	0.95	136	3.8	4.8
Parke, Davis	74.19	109.85	148	10.92	9.34	86	14.0	8.5
Pennsalt	14.42	59.21	411	1.04	3.11	299	7.0	5.2
Pfizer	39.22	127.00	324	9.35	14.16	151	23.8	11.2
Pitts. Pl. Glass	262.53	451.97	172	27.77	38.87	140	10.6	8.2
Procter & Gamble	533.91	850.26	159	48.62	42.03	86	9.1	4.9
Rohm & Haas	52.84	120.68	228	3.83	6.54	171	7.3	5.4
Schering	10.36	19.07	184	1.39	1.60	115	15.5	8.4
Smith-Douglass	19.18	37.16	194	1.68	2.18	130	8.8	5.9
Spencer†	15.70	30.84	196	3.57	4.66	131	22.7	15.1
Spencer Kellogg	141.52	110.65	78	12.37	0.13	1	8.7	0.12
Stauffer‡	70.18	76.64	109	4.52	5.46	121	6.4	7.1
Sterling	161.71	130.66	81	12.06	11.56	96	9.2	7.1
Tennessee Corp.	31.75	61.38	193	2.61	4.05	155	8.2	6.6
Texas Gulf Sulphur	53.37	78.28	147	21.67	24.53	113	39.1	31.4
Union Carbide	521.85	1,025.83	197	75.67	102.78	136	14.5	10.0
Victor	21.30	42.68	200	2.04	3.19	156	9.6	7.5
Virginia-Carolina	42.41	82.13	194	4.07	4.22	104	9.6	5.1

*Liquid Carbonic, net profit 1953: Nonrecurring losses of $506,840 have been included. The percentage of net profit is calculated, including these losses. If these losses are excluded the percentage net profit is 4.8%.
†Spencer Chemical Co.: Values not available for 1947; values used in 1947 column are for 1949, the earliest available.
‡Stauffer: Privately owned until Sept. '53; values used in 1947 column are for 1952.

Statistics compiled for CW by Robert J. Roth, Bjorksten Research Laboratories, Madison, Wis.

For reference to graphs, see next page

Easy Money, Rising Profits

SALES up, earnings up, financings moving along at a brisk pace. That's the financial outlook for most chemical companies this year.

A booming last quarter of 1954 has pushed production schedules in most sectors of the industry along at a rapid clip, should start to pay off when first-quarter '55 earnings are tallied.

Chemical companies will be borrowing more money this year, too, although their loans won't cost them any more than in '54. Reason: they'll need more money immediately to meet increased expansion costs, but bankers are convinced that the growth trend is a healthy one. They're convinced that there's enough muscle and momentum behind the current upsurge in earnings to carry well into 1956. Hence they will be satisfied with present borrowing charges.

Moreover, a goodly number of leading financial men point out that the current growth in chemical earnings is especially impressive because it's being registered without the aid of artificial props. Abnormal, short-lived influences—such as heavy inventory profits, large government contracts, or national shortages—just don't exist today. Any gain in earnings a company is able to chalk up is being won in a competitive market. There's virtually no chance of false showings; to look good in the earnings column, a company has to be robust in a business sense.

Normal Sequence: A faster business pace, of course, normally means an initial demand for more money. Producers need bank credit or stock sales to expand facilities, to meet heavier payrolls, to buy raw materials, and to cope with higher operating costs before the new investment starts to pay off.

And 1955's demand for money should be greater because of rock-bottom inventories. Numerous chemical companies have been concerned in recent weeks regarding their ability to meet spring pickups in product demand; others have already started to build up inventories to meet the expected surge. "It all takes money," one East Coast producer admits, "money most chemical companies won't be able to muster out of retained earnings."

Another big factor will increase chemical loans. The culprit: Uncle Sam's tax demands. Under the current accelerated tax payment plan for most corporations, 50% of 1955's taxes will have to be paid in March, rather than 45% (the other 50% in June). Some companies will also be forced to go to debt financing to meet 10% of their estimated 1956 taxes in September and December.

But with business solidly on the rise, interest rates should hold steady. (The prime rate—the charge made to the biggest borrowers with the highest credit rating—dropped from 3¼% to 3% last March, will probably remain there throughout 1955.)

Only Cloud Visible: Smaller chemical companies may find it more difficult to get needed funds, though. Reason: even on a short-term basis, some financial institutions are apt to favor lending large sums to a relatively select group of companies rather than administering a multiplicity of small loans to numerous firms.

Such a condition, if prevalent and pronounced over a period of months, could focus fresh attention on the Small Business Administration this year. SBA is now operated on a scale such as not to compete with banks and finance companies. (e.g., interest rates on SBA loans are fixed at 6%/year—permitting banks, if they want the business, to get the business.)

But if it becomes increasingly more difficult for small companies to keep pace in the industrial scramble in 1955, the government could well decide to push harder for additional loans, or seek some other means "to maintain competition."

Stocks Rising: Another aspect of the easy money and increasing profits picture in the chemical industry this year will be a trend toward slowly climbing common stock values. Not only does easy money generally exert a buoyant influence on blue-chip shares of well-established companies, but also (in a more tangible vein) opportunity for bolstered profits inevitably tends to inflate stock market prices.

This year should be no exception. The very fact that almost any company, in good standing, can float any reasonable bond issue or borrow needed money from banks and insurance companies at low rates will reduce its ratio of interest expense to income. And the greater the company's total debt financing, the more potent this effect will be on profits as a whole. Result: higher stock prices.

However, if the spiral continues too far—or too fast—and there are few new stock issues, there could be difficulties. Increased investor interest in chemical stocks with a relatively fixed supply of available shares could invite a good deal of speculative buying. Out of hand, it could develop into an alarming speculative binge.

Investment brokers assert that they're not especially worried about that possibility in 1955. Why: today's bull market is much less credit-based than at many times in the past. Investors seem to be much more interested in the returns and promise of chemical stocks than they are in realizing any short-term speculative gain.

Mergers (and the probability that more than a handful will be consumated within the chemical industry as soon as clearance is given by the Justice Dept. and the Federal Trade Commission) are whetting interest in common stock purchases, too. That trend should continue well into the year.

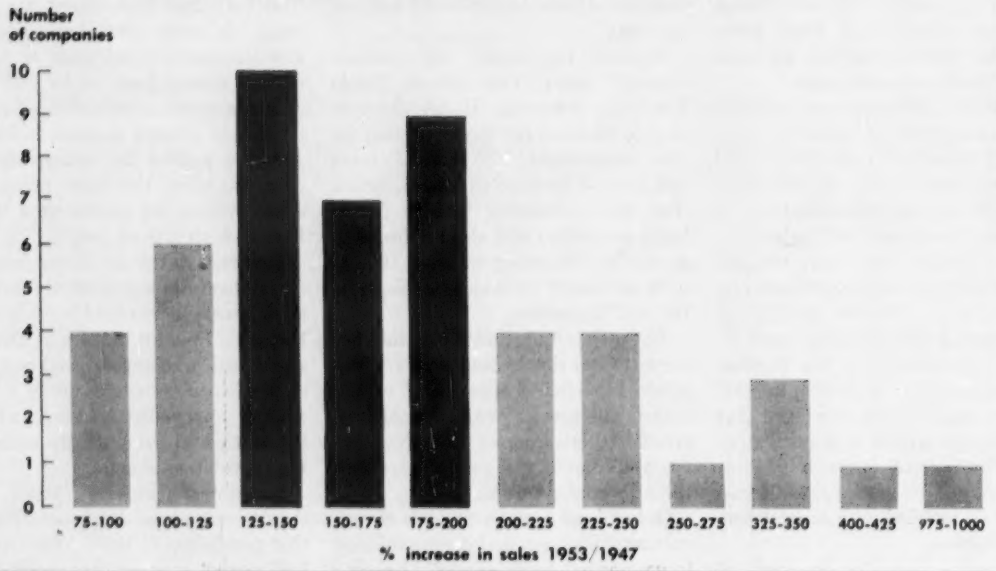
New Slant on Earnings: Finally, 1955 should be a year in which chemical stocks come to reflect more and more the affect of accelerated depreciation of new plants and equipment.

Commonly, in past years, depreciable assets have been written off the books in equal annual amounts over the period of their useful life. Now, for the first time, however (under the new tax law of 1954), chemical companies will be allowed accelerated depreciation allowances on newly purchased facilities.

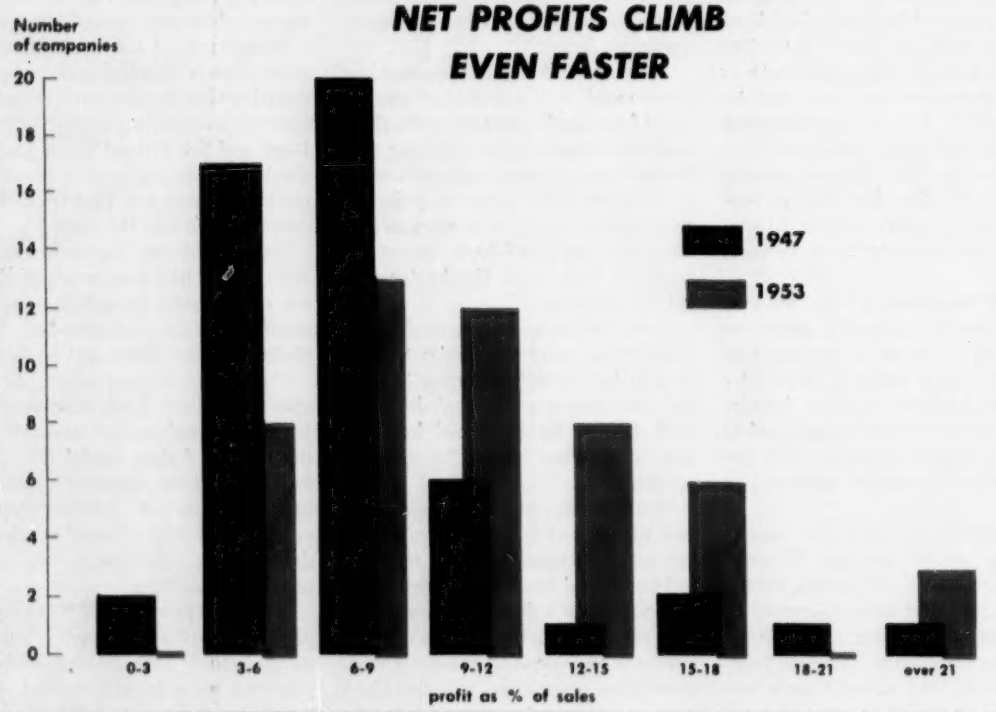
Will 1955 be a year of "crossing the peak" in all-time earnings? First estimates would indicate that although year-end records will exceed 1954, they'll not come up to 1953 standards.

Instead 1955 will be a year of steady improvement—leading toward new highs in 1956.

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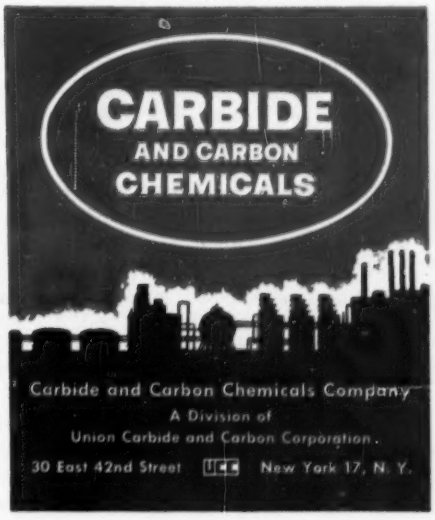
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Forecast for '55

OUTLOOK FOR FOOD ADDITIVE LEGISLATION

	Research and Safety Testing	Preuse Clearance	General Use	Legal Remedies
Present Law 1954	No need to study or test additive for safety—though it's customary for most manufacturers to do so.	Data need not be submitted to FDA prior to introduction. Most companies do submit data, ask unofficial okay.	No restrictions on general use. If any complaints, FDA must test material on its own.	If there is safety question, FDA must get injunction or seizure order from court, proving material harmful on basis of its own tests.
Proposed Changes 1955	Prior testing for safety to become mandatory.	All data must go to FDA before introduction. Fight is shaping up on whether FDA (1) must completely approve, or (2) must not object to additive use.	General use only after (1) approval, or (2) end of time in which FDA may object. If any complaints, FDA has maker's data as basis for further tests, study.	In any court action, if law requires full FDA approval, maker can use that O.K. as defense; if law requires only prior submission, maker's data can be used against him by FDA.

Here's the crucial issue

On Food Additives, Sterner Policing

IT'S a Washington axiom that technical shortcomings in little-understood laws are difficult to change. And to those who feel that contradictory provisions in the food and drug laws should be changed, and its coverage extended, the slowness—and at times, the nonexistence—of Congressional action has been particularly galling.

There is a good chance of amending the food and drug laws to remove this contradiction during the sessions of the 84th Congress, which begin next Wednesday. Where the 83rd Congress okayed formal procedures for setting tolerances on unintentional food additives (i.e., pesticides), its successor like as not will make up its mind on a similar approach for intentional food additives—and remove the presently contradictory provisions in the law over such tolerances.

Food additive amendment is only one of several items in the hopper this year, of course. Others: regulation of cosmetic chemicals, change in drug export provisions, modification of food standard laws, and—if the Food & Drug Administration will not voluntarily remove some antibiotics from certification—a change in the law to force such removal. Except for the antibiotic matter (discussion of which won't come up in the immediate future), there is little chance of Congressional approval on any of these. The only piece of legislation that seems assured of passage is the food law recodification measure, which will have to be revised from the form in which it was vetoed by President Eisenhower last August before it can be passed.

Recent controversy attached to intentional food additives certainly doesn't help its chances of ultimate passage. But at least it assures the matter will get public airing. Best bet: at least three, and perhaps as many as five, bills covering additives will be introduced in Congress this year.

No Wide Gulf: There is actually a very small area of disagreement between conflicting views. No one disputes that use of food additives has improved foods, that any additive, whether synthetic or natural, should be fully tested for safety, that all data on toxicological testing should go to FDA or that FDA should view such data with regard to the proportion of the additive used.

Argument will be over whether FDA, after being notified that a company wants to market an additive and after receiving all safety test data of the company, must then give its formal approval before marketing, or whether, after informal conferences with FDA, a manufacturer may go ahead and market unless FDA takes him to court. There will be good arguments supporting both points of view.

On one side, you'll hear that prime responsibility for food quality and safety lies with the food manufacturer, not with the additive producer.

The other side will say that responsibility for safety of a manufacturer's product should remain with him, not be shifted to a government agency; any agency that has the major responsibility for products of hundreds of manufacturers is prone to make timid, nonscientific decisions – or arbitrary ones that go beyond the scope of public health and safety, discouraging further research on food additives.

Within the framework of the latter argument, you can now locate two major groups. One is headed by Congressman James Delaney and the former counsel of his investigating committee, Vincent Kleinfeld, includes many lard manufacturers, meat, milling, dairy and baking companies.

The other major group, not as well defined, includes many food manufacturers, and – as secondary partners – chemical companies that make food additives.

It adds up to an interesting fencing duel over regulatory legislation in the months ahead.

Forecast for '55

OUTLOOK FOR POLLUTION IN 1955

	Research	Laws	Appropriation	Enforcement	Relocation
AIR POLLUTION	Government will boost basic studies on identification, analysis of pollutants, may look at auto exhaust problems.	Law to give fast tax write-offs for pollution equipment will be introduced in Congress. Outlook for passage: fair.	Public Health Service will get more money for research; funds for joint federal-state projects less likely to be allocated.	No federal laws likely here; it's now commonly considered to be strictly a local problem.	Federal officials will take no action on relocating refineries, industrial concerns.
WATER POLLUTION	Any boost in research will ride in on air pollution's shirttails.	Chance of fast tax write-offs not as good as for air pollution.	Little chance of increased money for research here, though it was authorized by 1948 Water Pollution Act.	Congress probably to accept plan for authorizing interstate pollution abatement groups; but there's likely to be dissent from certain strong groups in Washington.	Virtually nothing expected to happen here.

Here's where the fireworks will develop

Grimmer Laws for Pollution's Grime

YOUR company—likelier than not—has a heavy stake in one or more of the pollution control bills scheduled to come up this year in Congress and in various state legislatures.

It's a sure bet that new state laws and city ordinances on air and stream pollution will be on the books before July; and there's a better chance of new federal legislation on this subject in '55 than there has been for many years. State and city regulations will be aimed at curbing industrial, commercial and residential practices deemed to contribute to pollution; the proposed new federal laws would encourage further research, community planning, and purchase of pollution abatement equipment by industries and cities.

But Washington's attitude on pollution laws is slowly changing. In the past, it has been the feeling that any crackdown on pollution should come from the states, the cities, and the industries themselves. Now, however, more and more members of Congress as well as officials of executive agencies are coming around to the point of view that unless there's significant progress toward countrywide pollution control very soon, federal legislation with stringent enforcement measures may not be too far in the future.

Smog Stirs Lawmakers: The main reason that pollution legislation now has a better chance to get through Congress is the reaction to the smog situation in Los Angeles. Newspaper stories and pictures have emphatically brought home what municipal officials, wildlife conservation experts, and others have been saying for years. The legislative impetus, as of this month, is mostly on air pollution, a field in which there has been less previous action than on water pollution. But new action on one should increase chances of Congressional action on pollution in general.

You can expect any new legislation on either air or water pollution to go through one or more of these Congressional channels: tax exemption, housing aid, appropriations.

Longest discussed as a way to encourage industry to install pollution control equipment is tax exemption. Companies would be allowed to write off such facilities over the first five years they're in operation. But a bill written specifically to do this would probably not be passed. Conservative senators like Harry Byrd (D., Va.) have been noticeably reluctant to approve any tax innovations—even with complete approval by the Treasury Dept. And allowing fast depreciation for pollution equipment doesn't yet have Treasury support, though proponents have asked Treasury officials for suggestions on making it acceptable.

New Try Slated: Advocates of federal aid for air pollution control have come up with another approach: via housing, on the ground that air pollution blights city residential districts. Last year, Senators Homer Capehart (R., Ind.) and Tom Kuchel (R., Calif.) submitted a bill to amend the Housing Act to allow five-year depreciation, and authorize a $5-million research fund and a $50-million fund to guarantee loans for installation of abatement equipment. The measure passed the Senate, but was junked in Senate-House conference. Proponents will try again in '55, and may have better luck this year—if the Federal Housing Administration scandals do not rise up again to attract Congressional attention.

A 1948 law—still on the books—covers water pollution control. It provides for federal action on interstate pollution, for limited research, and for federal-state cooperation on certain pollution problems. This law has been little used to date; but increasing awareness about air and water pollution will prompt more federal action if it appears that states and industries aren't doing the job fast enough.

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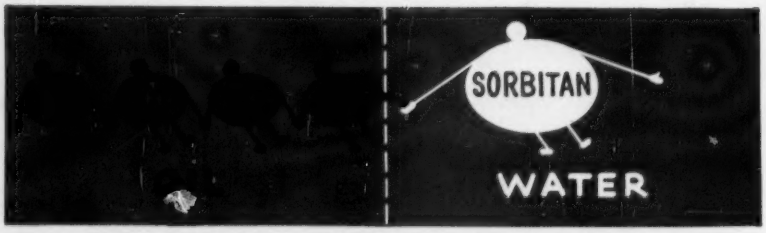
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Suppose you need to emulsify oil in water. For the particular oil you are using, a definite HLB value is required of the emulsifier. That is, the oil demands a specific water-attracting "pull" to be applied to it in order to accomplish the desired dispersion in water.

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Oil-soluble emulsifiers possess varying degrees of affinity for oil depending on the number and size of lipophilic hydrocarbon groups, such as may be derived from fatty acids.



Water-soluble emulsifiers are made in varying attraction for water by adding hydrophilic ethylene oxide chains.

"Oil-Loving" Emulsifiers

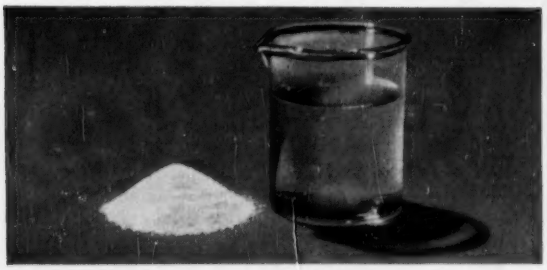
Similarly, if you are interested in water-in-oil emulsification, you need an emulsifier with a definite amount of attraction for oil. To produce such materials, Atlas builds emulsifiers with varying length of lipophilic component. The oil-loving part of these emulsifiers is a long chain fatty acid radical or a fatty alcohol. And the longer these chains get, the more lipophilic the emulsifier becomes . . . and the greater its ability (in general) to hold water. Thus, an emulsifier derived from oleic acid, which has 18 carbon atoms in its chain, has more oil-solubility and better water-holding power than one made from lauric acid, which has 12 carbon atoms.

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To give further flexibility to the formulator, Atlas emulsifiers can be blended together . . . producing an almost endless variety of oil and water attraction. These emulsifiers blend readily, because they belong to closely related chemical families and do not inter-react or interfere with one another. Instead, they supplement each other, joining forces to provide improved composite action.

If you'd like further information about the use of Atlas emulsifiers, write for a copy of "A Guide to Formulation of Industrial Emulsions with Atlas Surfactants." This booklet contains more than 60 typical formulas utilizing Atlas Products.

Non-volatile sorbitol provides permanent conditioning action



Sorbitol itself is a non-evaporating crystalline solid (left) . . . SORBO® is a 70% aqueous solution (right).

In choosing a moisture conditioning agent for your product, permanence is an important factor to consider. If a humectant has appreciable vapor pressure at normal temperatures, it will gradually disappear by evaporation, and its effectiveness in stabilizing moisture will slowly diminish.

Sorbitol, however, gives long-lasting conditioning action because it is completely non-volatile. The reason is simple. At normal temperatures, sorbitol itself is a *solid*. SORBO®, for example, is a 70% solution of sorbitol in water, and is widely used for conditioning purposes. The water content of sorbitol solutions can vary with the relative humidity but the humectant component — sorbitol — does not.

The permanence of sorbitol is particularly important in conditioning products which have a high surface-to-volume ratio, such as paper, regenerated cellulose or tobacco. Similarly, products such as cork and paper gasket and flexible glues must retain their useful characteristics during long periods of storage. During the winter, when humidities are low, storage can result in loss of moisture . . . some of which can be regained by exposure to high humidity later. If the conditioning agent has evaporated, too, flexibility cannot be restored. Similarly, products which are subjected to heating during manufacture need a humectant that does not disappear at processing temperatures.

How to Measure Volatility

You can't evaluate the volatility of a humectant simply by exposing open dishes of the conditioner solution and measuring their change in weight. This type of testing involves an inherent error, because it does not establish whether the loss in weight is due to loss of water or loss of humectant.

Volatility tests are made in our laboratories by soaking glassine paper in 25% aqueous solutions of various polyols for 48 hours. The paper samples are then placed in a cabinet at 75% R.H. and 100° F. for several days. Polyol content of the paper is then determined at regular intervals *by chemical analysis*. This method determines the weight change due to the conditioner content alone.

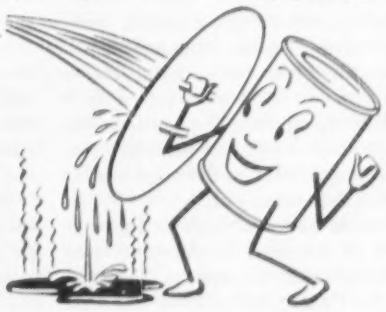
In a period of six days, for example, such a test shows a loss of as much as 75% of glycol . . . considerably less loss of glycerin . . . and *no loss at all* of sorbitol.

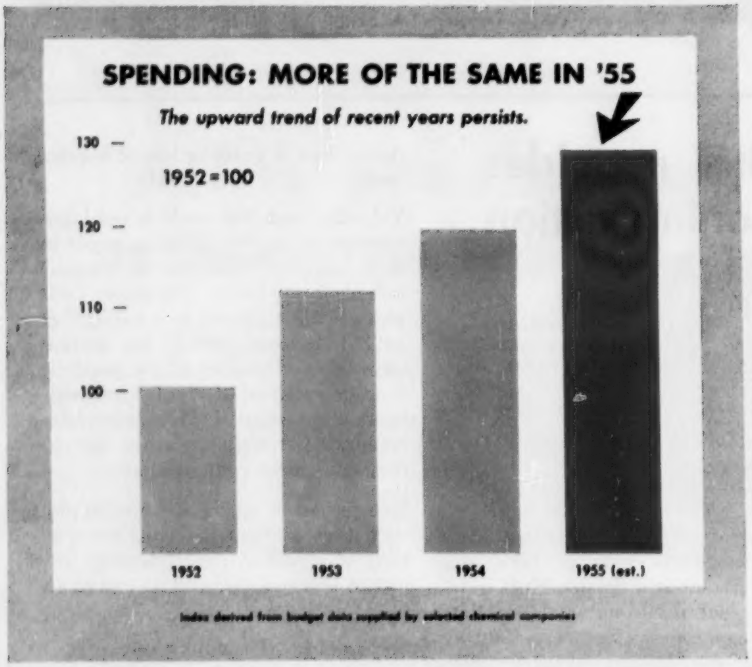
Sorbitol has other unique advantages as a conditioning agent. It holds less moisture at a given relative humidity than other widely used humectants . . . and thus prevents excessive humidity from causing sogginess in the product. It has a slower rate of change of moisture content . . . and thus helps the conditioned product to stay within a narrower moisture range when subjected to variable humidities. And it is compatible with practically all other materials normally encountered in conditioning problems. Best of all, it is economically priced . . . at a stable figure.

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More Demands on Research

BY EVERY outward sign, the coming year in research will tell a familiar story. Budgets once again will be up, new laboratories promise to appear with accustomed regularity, and technical manpower should still be a problem. Beneath the surface, however, there will be a difference.

Reflecting the outlook for increasing business competition, 1955-style research will bring more weight to bear on product and process improvement and relatively short-term product development.

Although these new demands won't throw large research programs off balance, they may well cause smaller companies to cut back some of their exploratory studies. There will be exceptions, of course, but majority opinion is firm in placing the emphasis for '55 on the faster payoff.

This, in turn, foreshadows a greater effort to get new developments into production with a minimum of wasted motion. Consequently, 1955 will be a year in which companies begin to think more seriously about bypassing the pilot plant, whenever possible, through increasing use of such tools as electronic "brains" and statistical design of experiments.

None of this will show up in budget totals. A *CW* survey indicates that research spending will once again be up roughly 10% (*see chart*) over the previous year's figure. Total chemical industry research outlay should be in the vicinity of $300 million.

A factor that will tend to depress the volume of research carried on in the chemical industry's laboratories is the continuing reduction (about $200 million over the three years ending June '55) in federal research spending. About half of these funds are spent in industry.

On the Upswing: Among the outlets for the chemical industry's research dollars, radioactivity appears destined to register the greatest gains in '55.

Last year, 2% of Oak Ridge National Laboratory's 12,000 isotope shipments went directly into industrial research. Many more, however, go to secondary processors that supply radioactive chemicals for research. Atomic Energy Commission expects industrial demand to mushroom, is talking about getting computing machines to keep track of isotope distribution and utilization.

New laboratories to accommodate this outpouring of isotopes are a certainty. Equally probable is a spate of new facilities to mobilize industry's growing interest in gamma rays as a potential key to new products and processes (*CW, Dec. 11, '54, p. 76*).

Radioactivity played a small but significant role in the $19.2 million worth of new laboratories completed (according to a Manufacturing Chemists' Assn. survey) by the chemical industry in the year ending last Oct. 31; it will be a bigger factor in the $38.1 million worth of chemical research facilities planned or under construction.

Research directors will also be paying considerably more heed to fast-moving German chemical developments. Many will be going abroad to cultivate foreign sources of scientific intelligence. More American research farmed out to European laboratories is also likely.

Emphasis on Overhead: The coming year doesn't appear to offer significant relief from familiar problems. Research directors will still have to scurry for high-grade scientific manpower. They will continue to seek ways of tightening the communication lines in their expanding establishments. And they will be more concerned than ever with the dwindling untapped reservoir of fundamental knowledge – a situation that cries out for more basic research.

But the big problem of '55 will be holding down the overhead. The trend in the direction of more elaborate apparatus and increasing space requirements per researcher is behind the recent tremendous boost in research costs. As the circle of business competition draws tighter during the coming year, research management will be under increasing pressure to seek new ways to reduce operating costs.

Forecast for '55

Production Pressures from Two Sides

Equipment suppliers, engineering firms and others who serve the process industries are an unusually good barometer of chemical activity. Several months before any significant upturn in building, their backlog of orders and number of inquiries will shoot up sharply. A *CW* survey of such firms revealed that:

- Almost 75% of them anticipate an increase in their business this year ranging from 5 to 15%.
- Another 20% feel that business would be about the same as last year, or slightly worse.
- The remaining 5% feel that business might skyrocket. They reported a large number of inquiries from chemical firms. And though they recognize that much of it was mere "window shopping," they do feel it might be rumblings of a boom.

LAST year, for the man in the plant, was something of a breather. It was a year in which he could forget about straining for more production and the difficulties of getting equipment. Instead, he could devote more time to long-range plans. He could concentrate on quality control, on programs to cut costs and to improve safety performances. He could, in short, take stock of the present with an eye to the future.

This year, his planning will stand him in good stead. For, in addition to the increased pressures in the economic cycle, he'll be feeling the effect of a changing technology. Here's why:

Right after the outbreak in Korea, there was a mad dash for more chemical capacity. This gave the industry an opportunity to try out some of its new processes as well as its newer ideas in plant design and operation. Many of the plants built as a result are already in and running. But a good portion (*see pp. 47-56*) won't start up until this year.

For the most part those that will start up this year are the more complex ones, characterized by the exploitation of higher temperatures and pressures and by a greater reliance on control engineering. From many aspects, these plants represent a zenith in chemical engineering achievements. But they pose new problems for the men charged with making them go.

Getting all the kinks out of some of them, for instance, will be no mean task, as can testify many engineers who learned the hard way over the past two years. One reason: many of them were built in a hurry and an extensive shakedown period is the natural penalty paid for time saved elsewhere. Possibly more fundamental, however, is the painful truth that equipment vendors—who must serve several industries—just aren't capable of coping with some of the requirements for the more intricate items of process equipment.

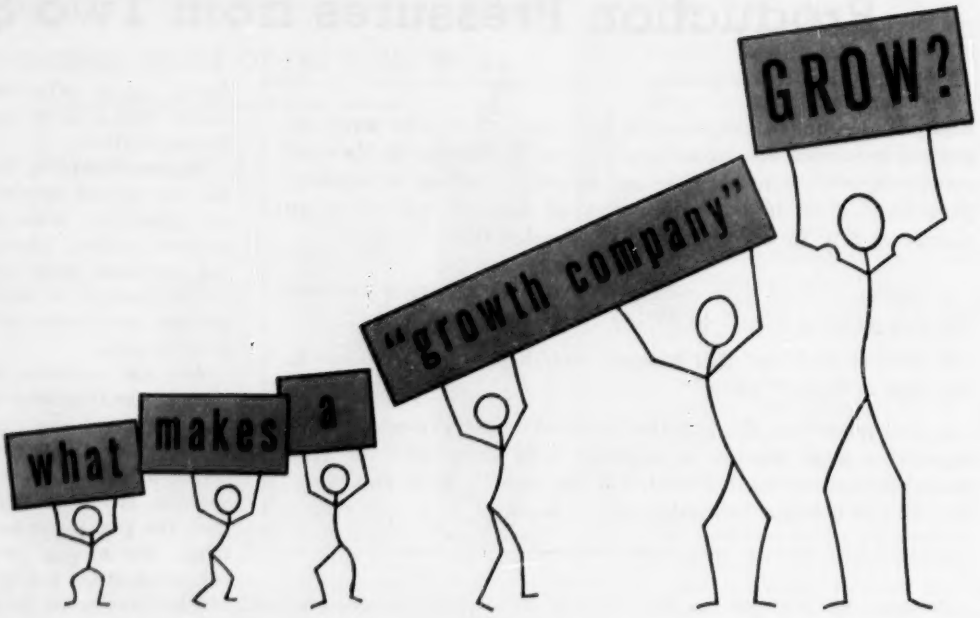
Maintenance in the newer plants is going to be an increasingly knotty—and costly—problem. And though the new plants require fewer operating personnel, the ones that are needed must have greater skills. Also, the fact that fewer men have to cover more ground can cause headaches in intraplant communication. It also calls for a new approach to safety questions. For despite the inherent advantages of having instruments take over some jobs, you can't get around the fact that there's nothing like having people who can detect potential trouble spots and take steps to combat them.

Brighter Sides: On the other hand, the start up and operation of a modern plant has some decidedly attractive features. Thoughtful design can anticipate many operating difficulties. Most of the newer plants, for instance, have built-in pollution abatement facilities.

And the executive in a modern plant has an impressive array of allies in the form of new equipment. The electrochemical industry, which received a big boost from mechanical rectifiers, may score even bigger gains from the germanium and silicon rectifiers now moving out of the development stage. Industrial television and two-way radios have helped lick the communications problem and this year you can look for a wider use of both. The atomic energy program has developed new techniques of handling reactive chemicals (like sodium and lithium) and new equipment (like canned pumps) that should pay handsome dividends in chemical processing. And makers of motors and other standard items are turning out more compact, more efficient products.

Calculating machines now being placed on the market should get a bigger play this year from plant engineers who will use them in conjunction with improved plant stream analyzers to determine optimum operating conditions. This year, too, plant men will lean more heavily on statistics and other scientific approaches to take some of the intuition out of the plant decisions. Statistical quality control programs have already proved their merit, of course. This year, operations research may well find its niche in plant operations. Significantly, one plant manager has called in an OR team not only to solve a problem but also to familiarize his staff with the techniques. He foresees the day when the larger chemical companies will have their own OR teams.

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Yes, the tangible benefits of joint endeavor are many. FMC Chemical Divisions will continue to use them to produce more and better chemicals for industry and agriculture. If you use any of the chemicals below, we can serve you promptly and well.

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FOOD MACHINERY AND CHEMICAL CORPORATION
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Chemical Divisions

FOOD MACHINERY AND CHEMICAL CORPORATION

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Westvaco CHEMICALS	DECCO	When You Use Niagara You Buy Profits	OHIO APEX fmc	Westvaco CHEMICALS
WESTVACO CHLOR-ALKALI DIVISION	DECCO CHEMICAL DIVISION	NIAGARA CHEMICAL DIVISION	OHIO-APEX DIVISION	WESTVACO MINERAL PRODUCTS DIVISION
New York, New York	Buffalo, New York	Middleport, New York	Nitro, West Virginia	New York, New York
Alkalis, Chlorinated Chemicals, Carbon Bisulfide	Peroxygen Chemicals	Insecticides, Fungicides and Industrial Sulphur	Plasticizers and Chemicals	Phosphates, Barium and Magnesium Chemicals

Forecast for '55

This Year's Plants: An Expansion Galaxy

Acetylene products

General Aniline & Film Corp.
Location: Calvert City, Ky.; value: $6 million.

Union Carbide and Carbon Corp.
Location: Montague, Mich.; value: $2 million.*

Acids, alcohols, aldehydes

Stanolind Oil and Gas Co.
Location: Brownsville, Tex.; capacity: 125 million lbs.; due in: September; process: liquid extraction and fractionation.

Acrylonitrile

B. F. Goodrich Chemical Co.
Location: Calvert City, Ky.; capacity: 24 million lbs.; due in: April; value: $8.5 million.

Adhesives

H. B. Fuller Co.
Location: Linden, N.J.; due in: January.

Alkylates

Cities Service Oil Co.
Location: Lake Charles, La.; capacity: 17,250 bbls./day.

Standard Oil Co. (Ind.)
Location: Casper, Wyo.; capacity: 700 bbls./day.

Allethrin

Carbide and Carbon Chemicals Co.
Location: Institute, W. Va.; capacity: 500,000 lbs.

Alumina

Aluminum Co. of America
Location: Bauxite, Ark.; capacity: 150,000 tons; due in: January.

Aluminum

Harvey Aluminum Co.
Location: The Dalles, Ore.; capacity: 54,000 tons; value: $35 million; process: reduction.*

Reynolds Metals Co.
Location: Sheffield, Ala.; value: $2.5 million.

Wheland Co.
Location: Chattanooga, Tenn.; capacity: 50,000 tons; value: $70 million; process: reduction.

Aluminum sulfate

Consolidated Chemical Industries, Inc.
Location: Houston, Texas.; capacity: 50 tons/day; due in: January; value: $250,000.

Ammonia

Allied Chemical & Dye Corp.
Location: Hopewell, Va.; due in: April; value: $5.6 million; process: conversion of natural gas. Location: South Point, O.; due in: June; value: $1.3 million; process: conversion of natural gas.

American Cyanamid Co.
Location: Fortier, La.; capacity: 300 tons/day; value: $50 million.

Arizona Gas & Chemical Co.
Location: Northern Arizona; value: $3 million; process: conversion of nitrogen.

Atlantic Refining Co.
Location: Philadelphia, Pa.; capacity: 100 tons/day; Process: by-product hydrogen from cat-former.

Atlas Powder Co.
Location: Atlas, Mo.; value: $7 million.*

Celanese Corp. of America
Location: Baton Rouge, La.; capacity: 150,000 to 200,000 tons; value: $10 million.*

Chillicothe Chemical Mfg. Co.
Capacity: 180 tons ammonia, 160 tons urea/day; due in: late in year or early '56; value: $17 million.

Columbia River Chemicals Co.
Location: Pasco, Wash.; capacity: 160 tons ammonia, 110 tons urea, 140 tons ammonium sulfate/day; value: $11.5 million; process: L'Air Liquide.*

Cooperative Farm Chemicals
Location: Lawrence, Kan.; capacity: 63,440 tons; value: $15 million.

Dow Chemical Co.
Location: Freeport, Tex.; capacity: double; due in: early in year; value: $3.6 million; process: by-product H_2 from Cl_2 process, N from air.

Food Machinery & Chemical Corp.
Location: S. Charleston, W. Va.; capacity: 60 tons/day; due in: late year.

Ketona Chemical Corp.
Location: Ketona, Ala.; capacity: 43,800 tons; due in: October; process: low-pressure separation.

Mississippi Chemical Corp.
Location: Yazoo City, Miss.; capacity: 70 tons/day; due in: March; value: $2 million; process: Claude.

Mississippi River Chemical Co.
Location: Selma, Mo.; capacity: 200 tons/day; due in: fall, 1955; value: $15 million; process: Claude.

National Distillers Products Corp.
Location: Tuscola, Ill.; capacity: increase from 50-60,000 tons; due in: midyear.

Northern Chemical Industries, Inc.
Location: Searsport, Me.; capacity: 125 tons/day; due in: December; value: $9 million; process: synthesis gas preparation.

* Firmly planned but not yet under construction.

Forecast for '55

Salt Lake Chemical Co.
Location: Salt Lake City, Utah; capacity: 120 tons/day; due in: third quarter, 1955; value: $7.8 million; process: from natural gas.*

Sinclair Refining Co.
Location: Hammond, Ind.; capacity: 300 tons/day; due in: early 1956; process: from by-product hydrogen and other gases.

Standard Oil Co. (Ind.)

Standard Oil Co. (Ohio)
Location: Lima,O.; capacity: 300 tons/day; due in: November; value: $17 million; process: Kellogg.

Sun Oil Co.
Location: Marcus Hook, Pa.; capacity: 300 tons/day; due in: November; value: $9 million; process: American low-pressure synthesis.

United Chemical Co.
Location: Timpson, Tex.; due in: late 1955; value: $18 million.

United States Steel Corp.
Location: Geneva, Utah; capacity: 200 tons/day; due in: mid-1956; value: $18 million; process: coke oven gas.

Utah Chemical Co.
Location: Southeastern Utah; capacity: 278 tons/day; value: $18.7 million; process: from natural gas.*

Ammonium nitrate

Brea Chemicals, Inc.
Location: Brea, Calif.; value: $2.5-million.*

Ammonium phosphate

Agriform
Location: Pasco, Wash.

Ammonium sulfate

Filtrol Corp.
Location: Vernon, Calif.; capacity: 150 tons/day; due in: March; value: $6.5 million; process: using effluent from clay processing.

Rohm & Haas Co.
Location: Deer Park, Tex.; value: $1.3 million.*

Antiknock compound

Ethyl Corp.
Location: Houston, Tex.; capacity: 15% expansion; due in: early in year.
Location: Baton Rouge, La.; capacity: 15% expansion; due in: early in year.

Argon

Burdett Oxygen Co.
Location: Cleveland; capacity: 100,000 cu. ft./day; value: $500,000.

Asphalt

Esso Standard Oil Co.
Location: Fayetteville, N.C.; value: $600,000.

Atomic fission products

U.S. Government (AEC)
Location: Rocky Flats, Colo.; value: $44 million.

Benzene, toluene, xylene

D. D. Feldman
Location: Lake Arthur, La.; value: $1.3 million.*

Benzene hexachloride

Pennsylvania Salt Mfg. Co.
Location: Calvert City, Ky.; value: $2 million; process: new continuous.

Butadiene

Carbide and Carbon Chemicals Co.
Location: Seadrift, Tex.; value: $2.5 million.*

William R. Staats and Co.
Location: Texas; capacity 40,000 tons.

Texas Butadiene & Chemical Co.
Location: Texas; capacity 40,000 tons; value: $26 million; process: direct from butane.

Calcium carbide

Midwest Carbide Corp.
Location: Pryor, Okla.; value: $3 million.

Caprolactam monomer

Allied Chemical & Dye Corp.
Location: Chesterfield, Va.; capacity: 20 million lbs.; due in: January; value: $25 million; process: own.

Mathieson
Location: Morgantown, W. Va.

Carbon black

Columbian Carbon Co.
Location: St. Mary's Parish, La.; capacity: 60 million lbs.; due in: 1955; value: $3 million; process: Columbian's furnace.

Phillips Chemical Co.
Location: Borger, Tex.; value: $2 million.*

Carbon dioxide

Allied Chemical & Dye Corp.
Location: Hopewell, Va.; due in: May; process: compression of waste CO_2 from ammonia process.

Food Machinery & Chemical Corp.
Location: Lawrence, Kan.; due in: May; process: CO_2 from present phosphate operations.

Lion Oil Co.
Location: Luling, La.; capacity: 42 tons/day; value: $550,000.

The Liquid Carbonic Corp.
Location: Houston, Tex.; capacity: 40 tons/day; due in: May; value: $500,000.
Location: San Francisco; capacity: 40 tons/day; due in: August; value: $1.5 million.

Carboxymethylcellulose

Wyandotte Chemicals Corp.
Location: Wyandotte, Mich.; due in: 1955.

Catalysts

The Girdler Co.
Location: Louisville, Ky.; due in: early 1955.

Catalysts, petroleum

Universal Oil Products
Location: McCook, Ill.

Cellophane

Du Pont Co.
Location: Old Hickory, Tenn.; capacity: 20% increase; value: $2 million.

Olin Mathieson Chemical Corp.
Location: Olin, Ind.; capacity: 33 million lbs.; due in: 1956.
Location: Red Bluff, Calif.*

Cellulose gum

Hercules Powder Co.
Location: Hopewell, Va.; value: $1.8 million.*

Cement

Wyandotte Chemicals Corp.
Location: Wyandotte, Mich.; due in: 1955.

Chlorinated rubber (parlon)

Hercules Powder Co.
Location: Parlin, N.J.; capacity: 50% increase in current facilities; due in: late in year; process: chlorination of rubber.

Chlorine

General Aniline & Film Corp.
Location: Linden, N.J.; capacity: 26 tons/day; value: $3 million.

Chlorine-caustic

Weyerhaeuser Timber Co.
Location: Longview, Wash.; capacity: 115 tons caustic, 100 tons chlorine/day; due in: late year.

Chlorohydrins, crude

Shell Chemical Corp.
Location: Norco, La.; due in: first quarter; value: $8.5 million.

Clay products, calcined

Gladding-McBean & Co.
Location: Ione, Calif.; due in: first quarter.

Cleaning materials, industrial

Wyandotte Chemicals Corp.
Location: Wyandotte, Mich.; due in: 1955.

Coke

Bethlehem Steel Co.
Location: Lackawanna, N.Y.; value: $1.5 million.*
Location: Steelton, Pa.; value $7 million.*

Donner-Hanna Coke Co.
Location: Buffalo, N.Y.; value: $365,000.*

Ford Motor Co.
Location: Dearborn, Mich.; value: $200,000.

Jones & Laughlin Steel Corp.
Location: Cleveland; value: $500,000.

Sharon Steel Corp.
Location: Farrell, O.; value: $16.5 million.

United States Steel Corp.
Location: Gary, Ind.; value: $50 million.

Concrete, bituminous

Allied Chemical & Dye Corp.
Location: Syracuse, N.Y.; due in: June; process: coating.

Cracking catalyst, microspheroidal

National Aluminate Corp.
Location: South Gate, Calif.; value: several million.

Dacron

Du Pont Co.
Location: Old Hickory, Tenn.; value: $10-20 million.*

Diisocyanates

Allied Chemical & Dye Corp.
Location: Buffalo, N.Y.; due in: March.

Dimer acid

Emery Industries
Location: Cincinnati.

Dimethyl terephthalate

Hercules Powder Co.
Location: Burlington, N.J.; capacity: 12 million lbs.; due in: first quarter, 1955; value: $4.5 million; process: air oxidation of para-xylene.

Diphenylamine

American Cyanamid Co.
Location: Bound Brook, N.J.; capacity: 8 million lbs.; due in: April.

Dyes

Arnold, Hoffman & Co.
Location: Providence, R.I.

Gaston Chemicals, Inc.
Location: Spencer Mountain, N.C.

Ethanolamine

Allied Chemical & Dye Corp.
Location: Orange, Tex.; due in: February; process: own.

Jefferson Chemical Co., Inc.
Location: Port Neches, Tex.; capacity: 50% increase.

Forecast for '55

Ethyl alcohol

Schenley Distillers Co.
Location: Kansas City, Mo.; value: $2 million.*

Ethylene

Gulf Oil Corp.
Location: Port Arthur, Tex.; capacity: 3 billion cu. ft.; due in: early spring; value: 18-20 million.

Feldspar

International Minerals & Chemicals Corp.
Location: Southern Connecticut; process: Le Baron-Lawyer.

Ferro nickel

Hanna Nickel Smelting Corp.
Location: Riddle, Ore.; capacity: 95-125 million lbs.; value: $22 million.

Fertilizer

Bluegrass Plant Foods Co.
Location: Cynthiana, Ky.; value: $250,000.

Carstens Packing Co.
Location: Tacoma, Wash.; capacity: 20,000 tons; value: $175,000.

Darling & Co.
Location: Chicago; capacity: boost from 42-50,000 tons.

The Farm Bureau Cooperative Assn.
Location: Mt. Gilead, O.; capacity: 70,000 tons; due in: July; value: $750,000.

Farm Bureau Service
Location: Kalamazoo, Mich.; capacity, 30,000 tons.

Federal Chemical
Location: Butler, Ind.; capacity: double.

Illinois Farm Supply Co.
Location: Tuscola, Ill.; capacity: 50,000 tons; due in: March; value: $1.25 million; process: TVA continuous ammoniation and granulation.

Jefferson Lake Sulphur Co.
Location Southeastern Idaho; value: over $3 million.

F. S. Royster Guano Co.
Location: Indianapolis; capacity: 20 tons/hour; value: $500,000.

Stauffer Chemical Co.
Location: Vernon, Calif.; due in: midyear; value: $750,000.

Tri-State Chemical
Location: Springdale, Ark.; value: $150,000.

Fertilizer, nitrophosphate

Associated Coop
Location: Muscle Shoals, Ala.; capacity: 60,000 tons; value: $2 million.

Gulf Improvement Co.
Location: Pascagoula, Miss.; value: $15 million.

International Minerals & Chemical Corp.
Location: Tuscola, Ill.; value: $10.5 million.*

Lange Brothers
Location: Audrain County, Mo.; value: $8 million.*

E. Rauh & Sons
Location: Tuscola, Ill.; value: $2 million.*

Fertilizer, phosphatic

Gates Brothers, Inc.
Location: Montpelier, Idaho; value: $2 million.*

Finishes, industrial

Interchemical Corp.
Location: Los Angeles, Calif.; due in: April; value: $300,000.

Formaldehyde

Allied Chemical & Dye Corp.
Location: South Point, O.; due in: January; value: $2.3 million; process: oxidation of methanol.

Celanese Corp. of America
Location: Belvidere, N.J.; value: $1.2 million.*

Freon

Du Pont Co.
Location: Antioch, Calif.
Location: Louisville, Ky.; due in: early fall.

Furfural

Brown Co.
Location: Berlin, N.H.; value: multimillion; process: from sulfite waste liquor.

T. N. Peck and Associates, Inc.
Location: Burnside, Ky.; due in: midyear; value: $3 million; process: wood distillation.

Gas, natural, products

Barnhart-Hydrocarbon
Location: Big Lake, Tex.; value: $700,000.*

Genetrons 11 & 12

Allied Chemical & Dye Corp.
Location: Danville, Ill.; due in: June.

Glycerine

Dow Chemical Co.
Location: Freeport, Tex.; due in: Jan. '56; value: $5.5 million.

Gypsum

Celotex Corp.
Location: Port Clinton, O.; capacity: double current capacity; value: $3 million.

The National Gypsum Co.
Location: Halifax, N.S.; Baltimore, Md.; New York, N.Y., Savannah, Ga., Shoals, Ind.; due in: March, 1956; value: $15 million.

Herbicide

Pittsburgh Agricultural Chemical
Location: Neville Island, Pa.

Hydrofluoric acid

Allied Chemical & Dye Corp.
Location: Baton Rouge, La.; due in: October; value: $385,000; process: reaction of sulfuric acid and fluorspar.

Blockson Chemical Co.
Location: Joliet, Ill.; capacity: moderate.

Hydrogen peroxide

Allied Chemical & Dye Corp.
Location: Syracuse, N.Y.; due in: September; process: nonelectrolytic.

Ilmenite

Du Pont Co.
Location: Lawtey, Fla.; capacity: 100,000 tons; due in: early year; value: $3 million.

Isocyanates

Moboy Chemical Co. (Monsanto and Farbenfabriken Bayer
Location: Martinsdale, W.Va.; capacity: several hundred lbs./month; due in: late year.

Isophthalic acid

Standard Oil Co. (Calif.) (Oronite)
Location: Richmond, Calif.; capacity: 50 million lbs.; due in: October; value: $11 million.

Isopropyl alcohol

Shell Chemical Corp.
Location: Norco, La.; due in: late year; value: $7.5 million.

Lignin extract

Rayonier, Inc.
Location: Hoquiam, Wash.

Lignite, dried

Aluminum Co. of America
Location: Rockdale, Tex.

Lime, chemical grade

Chemical Lime, Ltd.
Location: Baker, Ore.; capacity: 30,000 tons.

Lithium

Lithium Corp. of America
Location: Bessemer City, N.C.; due in: January; value: $7 million; process: own patented process of extraction of lithium.

Lithium hydroxide

Foote Mineral Co.
Location: Sunbright, Va.; due in: first quarter; value: $2 million; process: lime-spod.

Nicholls Chemical
Location: Canon City, Colo.; capacity: 50,000 lbs./month; value: $500,000.

Magnesium

Reade Mfg. Co., Inc.
Location: Lakehurst, N.J.; capacity: double current output—to 200,000 lbs./month.

Manganese

Manganese Chemical Corp.
Location: Riverton, Minn.

Metasilicates

Wyandotte Chemicals Corp.
Location: Wyandotte, Mich.

Methanol

Heyden Chemical Corp.
Monsanto Chemical Co.
Location: Texas City, Tex.; capacity: 25 million gal.; due in: January; value: $20 million.
(jointly owned 50%-50% with Monsanto)

Methionine

Du Pont Co.
Location: Beaumont, Tex.; value: $4 million.

Methyl chloride

General Electric Co.
Location: Waterford, N.Y.; value: $10.5 million.*

Methyl ethyl ketone

Esso Standard Oil Co.
Location: Bayway, N.J.; value: $2.9 million.*

Methyl mercaptan

Pan American Refining Corp.
Location: Texas City, Tex.; capacity: 5 million lbs.; due in: February.

Thiochemicals, Inc.*
Location: Port Arthur, Tex.; value: $500,000; process: from hydrogen sulfide.

Methylstyrene

American Cyanamid Co.
Location: Avondale, La.; value: $8 million.*

Mono- and Diglycerides

Atlas Powder Co.
Location: Memphis, Tenn.; due in: January; value: $1.1 million.

Naphtha

Esso Standard Oil Co.
Location: Baltimore, Md.; capacity: 15,000 bbls./day; value: $3.5 million.*

Pure Oil Co.
Location: Heath, O.; capacity: 3000 bbl./day; value: $2 million; process: Kellogg using regenerative platinum catalyst.

Naphthalene

Allied Chemical & Dye Corp.
Location: Chicago; due in: March; value: $500,000; process: tar distillation.

Forecast for '55

Naphthalene, toluene, benzene, xylene

Petrocarbon Chemicals Co.
Location: Dallas, Tex.; capacity: 1000 bbls./day, value: $1 million; process: Houdriformer.

Neoprene

Du Pont Co.
Location: Montague, Mich.; due in: 1956; value: $15 million.

Nickel

International Nickel Co., Inc.
Location: Huntington, W. Va.; value: $425,000.*

Freeport Sulphur Co.
Location: New Orleans, La.; capacity: 50 tons/day of ore; due in: fourth quarter; process: sulfuric acid leaching.

Nitric acid

Spencer Chemical Co.
Location: Henderson, Ky.; due in: summer; value: $2 million.

Nitrogen products

Monsanto Chemical Co.
Location: Texas City, Tex.; value: $16.8 million.*

Nitroparaffins

Commercial Solvents Corp.
Location: Sterlington, La.; due in: August; value: $5 million; Process: nitration of propane gas.

Nylon

American Enka Corp.
Location: Enka, N.C.; value: $1.6 million.

The Chemstrand Corp.
Location: Pensacola, Fla.; capacity: 50 million lbs.; due in: early in year.

Du Pont Co.
Location: Chattanooga, Tenn.; value: $236,000.

Industrial Rayon Corp.
Location: Covington, Va.; capacity: 6 million lbs.; due in: December; value: $5 million.

Oxygen, acetylene

The Liquid Carbonic Corp.
Location: Chicago; value: $225,000.

National Cylinder Gas Co.
Location: Knoxville, Tenn.; capacity: 10 million cu. ft./month.

Oxygen, liquid

National Cylinder Gas Co.
Location: Chicago; value: $3.5 million.

Paint intermediates

Jones-Dabney Co.
Location: Louisville, Ky.; due in: January; value: $40,000.

Paper and pulp

Bowaters Southern
Location: Calhoun, Tenn.; capacity, 50,000 tons kraft pulp, 125,000 tons newsprint; value: $51 million.

Dierks Lumber and Coal Co.
Location: Southern Arkansas; value: $20 million.

Great Northern Paper Co.
Location: East Millinocket, Me.; capacity: 150,000 tons; due in: January; value: $40 million.

Hudson Pulp Paper Corp.
Location: Palatka, Fla.; due in: 1956; value: $15 million.

International Paper Corp.
Location: Camden, Ark.; value: $2 million.

Rhinelander Paper Co.
Location: Rhinelander, Wis.; value: $700,000.

St. Helens Pulp & Paper Co.
Location: St. Helens, Ore.; capacity: increase to 35,000 tons; value: $15 million.

St. Regis Paper Co.
Location: Pensacola, Fla.; value: $4.5 million.

Scott Paper Co.
Location: Everett, Wash.; capacity: 120 tons/day.

Southern Newspaper Publishers' Assn.
Location: Southern U.S.; capacity: 50-60,000 tons; value: $12 million.

Southland Paper Mills, Inc.
Location: Lufkin, Tex.; capacity: 70,000 tons.

Western Kraft Corp.
Location: Albany, Ore.; capacity: 100 tons/day; value: multimillion.

Pentachlorophenol

Reichhold Chemical Co.
Location: Portland, Ore.; capacity: 6 million lbs.; due in: late spring.

Pentaerythritol

Delaware Chemicals, Inc.
Location: Newark, N.J.; value: $1 million.

Hercules Powder Co.
Location: Mansfield, Mass.; capacity: expansion 18-24 million lbs.

Reichhold Chemicals, Inc.
Location: Tuscaloosa, Ala.; capacity: 5 million lbs. (and 30 million lbs. formaldehyde); value: $3 million.*

Warren Petroleum Corp.
Location: Conroe, Tex.; capacity: 2.5 million lbs. (and 4 million lbs. methyl alcohol, 2 million lbs. acetaldehyde); value: $2 million.

Perchlorethylene, anhydrous hydrochloric acid

Hooker-Detrex
Location: Ashtabula, O.; value: $1 million.

Perchloric acid

Western Electrochemical Co.
Location: Henderson, Nev.*

Perchlormethylmercaptan ("Captan" fungicide)

Calhio Chemical Co. (Stauffer)
Location: Perry, O.; due in: January; value: $900,000.

Petroleum gases, liquefied

Gulf Refining Co.
Location: St. Landry Parish, La.; capacity: 11 million bbls. propane, 10 million bbls. butane, 6.5 million bbls. condensate; value: $10 million.

Phenol

Monsanto Chemical Co.
Location: Monsanto, Ill.

Phosphoric acid and phosphates

Monsanto Chemical Co.
Location: Kearney, N.J.; capacity: about 50,000 tons.

Virginia-Carolina Chemical Corp.
Location: Cincinnati, O.; capacity: 25,000 tons; due in: midyear; value: $1 million.

Phosphorus

Monsanto Chemical Co.
Location: Soda Springs, Idaho.

Phosphorus chlorides

Victor Chemical Works
Location: Morrisville, Pa.; capacity: over double current capacity.

Photo-base paper

Allied Paper Mills
Location: Kalamazoo, Mich.; process: barium sulfate-coated.

Phthalic anhydride

American Cyanamid Co.
Location: Bridgeville, Pa.; capacity: double to 48 million lbs.; value: $6 million.

Monsanto Chemical Co.
Location: St. Louis, Mo.; capacity: double to 50 million lbs.; value: $5 million.

Reichhold Chemicals, Inc.
Location: Elizabeth, N.J.; capacity: 80 million lbs.*

Sherwin-Williams Co.
Location: Chicago, Ill.; capacity: double to 6 million lbs.; value: $750,000.

Plastics

Acheson Dispersed Pigments Co.
Location: Orange, Tex.; value: $500,000.

Platinum catalyst

American Cyanamid Co.
Location: Willow Island, W. Va.; value: $1.5 million.*

Baker & Co.
Location: Newark, N.J.; value: $2.5 million.

Pluronics surface-active agents

Wyandotte Chemicals Corp.
Location: Wyandotte, Mich.

Plutonium

General Electric Co.
Location: Hanford, Wash.; value: $40 million.

Polyester film

Du Pont Co.
Location: Circleville, O.; due in: early in year; value: $10 million.

Polyethylene

Dow Chemical Co.
Location: Freeport, Tex.; capacity: 25 million lbs.; due in: summer; value: $11 million.

Koppers Co., Inc.
Location: Port Arthur, Tex.; due in: September.

Monsanto Chemical Co.
Location: Texas City, Tex.; capacity: 66 million lbs.

National Petro-Chemicals Corp.
Location: Tuscola, Ill.; capacity: 25 million lbs.; due in: spring.

Phillips Chemical Co.
Location: Port Adams, Tex.

Spencer Chemical Co.
Location: Orange, Tex.; capacity: 45 million lbs.; due in: spring; value: $25 million; process: ICI.

Texas Eastman Co.
Location: Longview, Tex.; capacity: 20 million lbs.; value: $7 million.

Union Carbide and Carbon Corp.
Location: Torrance, Calif.; capacity: 60 million lbs.; due in: late in year; value: $36 million.

The Visking Corp.
Location: Flemington, N.J.; due in: February; value: $1 million; process: extrusion.

Polyethylene terephthalate

Du Pont Co.
Location: Parlin, N.J.; due in: midyear.

Polyisocyanates

Du Pont Co.
Location: Deepwater Point, N.J.; due in: mid-1956.

Polystyrene

Catalin Co.
Location: Calumet City, Ill.

Bakelite Co., Div. Union Carbide and Carbon Corp.
Location: Marietta, O.; value: $6 million.*

Forecast for '55

Polyvinyl acetate

The Borden Co.
Location: Dominguez (Los Angeles), Calif.; capacity: 3 million lbs.; due in: January.

Polyvinyl butyral

Shawinigan Products Corp.
Location: Springfield, Mass.; value: $400,000.*

Polyvinyl chloride

The General Tire & Rubber Co.
Location: Ashtabula, O.; capacity: 25 million lbs.; due in: early in year; value: $6 million; process: from pure acetylene gas and hydrogen chloride.

Monsanto Chemical Co.
Location: Indian Orchard, Mass.; value: $2.7 million.
Location: Springfield, Mass.; value: $1.2 million.*

Seiberling Rubber Co.
Location: Newcomerstown, O.

Polyvinyl resins

National Starch Products, Inc.
Location: Meredosia, Ill.; due in: June; process: polymerization.

Potash

National Farmers' Union
Location: Carlsbad, N.M.; value: $12-14 million.

Rare earth chemicals

Lindsay Chemical Co.
Location: W. Chicago, Ill.

Rayon, viscose

American Enka Corp.
Location: Lowland, Tenn.; value: $4 million.

Courtaulds-Alabama, Inc.
Location: LeMoyne, Ala.; capacity: 50 million lbs.; due in: spring.

Refractories

International Minerals & Chemicals Corp.
Location: Janesville, Wis.; capacity: 75,000 tons.

Resins

American Marietta Co.
Location: Seattle, Wash.; capacity: 25% increase in current facilities; value: $75,000.

The General Latex & Chemical Corp.
Location: Cambridge, Mass.; value: $300,000.

Rubber, butyl

Goodrich-Gulf Chemicals
Location: Orange, Tex.; process: Esso patents.

Petroleum Chemical
Location: Lake Charles, La.; due in: '56; value: $29 million.

Rubber, compounded

The Whitney Blake Co.
Location: Hamden, Conn.; value: $800,000.*

Rubber, synthetic, chemicals

The Goodyear Tire & Rubber Co.
Location: Niagara Falls, N.Y.; value: $4 million.

Salt cake and sodium sulfate

West End Chemical Co.
Location: West End, Calif.; capacity: 50,000 tons; due in: summer.

Silicates, synthetic

Johns-Manville Products Corp.
Location: Lompoc, Calif.; due in: January; process: directly from crude diatomite by reaction with lime or magnesia under pressure.

Silicon

Dow Corning Corp.
Location: Midland, Mich.; capacity: 300 tons/month; due in: early in year; value: $1.2 million; process: electric furnace.

Linde Air Products Co. (Carbide)
Location: Long Reach, W.Va.; due in: December; value: $14 million.

Soda ash

Dow Chemical Co.
Location: Freeport, Tex.; capacity: 300 tons/day; value: $3 million.

Sodium bisulfate

Allied Chemical & Dye Corp.
Location: North Claymont, Del.; due in: March.

Monsanto Chemical Co.
Location: Everett, Mass.

Sodium chlorate

Oldbury Electro-Chemical Co.
Location: Columbus, Ga.; capacity: 25 million lbs., value: $3.5 million.

Sodium phosphates

Shea Chemical Corp.
Location: Jeffersonville, Ind.; capacity: 60,000 tons sodium phosphate and 80,000 tons phosphoric acid; due in: August; process: new-type converters.

Specialty products

R. M. Hollingshead Corp.
Location: Sunnyvale, Calif.; due in: February; value: $1 million.

Pennsylvania Salt Mfg. Co.
Location: Chicago Heights, Ill., due in: January, value: $600,000.
Location: Delaware, O.; due in: January; value: $425,000.

Styrene, acrylonitrile

United States Rubber Co.
Location: Baton Rouge, La.; value: $1.4 million.

Styrene plastics

Monsanto Chemical Co.
Location: Addyston, O.*

Sugar

Imperial Sugar Co.
Location: Sugar Land, Tex.; capacity: expansion to 2.25 million lbs./24-hour operation; due in: early in year; value: $957,000.

Sulfur

American Sulphur & Refining Co.
Location: Sulphurdale, Utah; capacity: 100 tons/day; value: $1 million.

Continental Sulphur & Phosphate Corp.
Location: Sulphur, Nev.; capacity: 50-75 tons/day; value: $200,000; process: solvent extraction.
Location: Thermopolis, Wyo.; capacity: expansion to 150 tons/day; process: solvent extraction.

Freeport Sulphur Co.
Location: Chacahoula, La.; due in: first quarter; process: Frasch.
Location: Freeport, Tex.; value: $2.7 million.*

Great Northern Oil Co.
Capacity: 70 tons/day (estimated).*

Standard Sulphur Co.
Location: Damon Mound, Brazoria County, Tex.; capacity: 150 tons/day; value: $1.5 million.

Stauffer Chemical Co.
Location: Monongahela, Pa.; value: $1 million.
Location: Tampa, Fla.; due in: midyear; value: $300,000.

Union Oil Corp.
Location: Oleum, Calif.; capacity: 50 tons/day; due in: February; value: $600,000; process: from refinery waste gas.

Sulfuric acid

Allied Chemical & Dye Corp.
Location: Richmond, Calif.; due in: June; process contact.

Anaconda Copper Mining Co.
Location: Anaconda, Montana; value: $1.4 million.*

Consolidated Chemical Industries, Inc.
Location: Baytown, Tex.; capacity: 500 tons/day; due in: May; value: 4.5 million; process: regeneration.
Location: Houston, Tex.; capacity: 500 tons/day; due in: May; value: 4.5 million; process: regeneration.

Davison Chemical Co.
Location: Nashville, Tenn.; value: $950,000.*

Eagle-Picher Co.
Location: Galena, Kan.; capacity: 240 tons/day; value: $4 million; process: gases from new zinc roasting plant.

Gates Brothers, Inc.
Location: Wendell, Idaho; value: $800,000.*

W. R. Grace & Co.
Location: Joplin, Mo., value: $1.5 million.

International Minerals & Chemical Corp.
Location: Mason City, Iowa; value: $400,000.*
Location: Wilmington, N.C.; value: $500,000.*

Rico Argentine Mining Co.
Location: Rico: Colo.; capacity: 200 tons/day; due in: July; value: $1.5 million; process: contact

Stauffer Chemical Co.
Location: Whiting, Ind.; value: $2 million.*

United States Industrial Chemicals, Inc.
Location: Tuscola, Ill.; capacity: 140,000 tons; value, $2 million.

Superphosphates

Armour & Co.
Location: Bartow, Fla.; capacity: double to 80,000 tons.

Hughes-Johnson Chemical Co.
Location: Portland, Ore.; capacity: 20,000 tons; due in: January.

International Minerals & Chemical Corp.
Location: Bonnie, Fla.; capacity: 25,000 tons; value: $14 million.

National Farmers' Union
Location: Canon City, Colo.; value: $6 million.*

F. S. Royster Guano Co.
Location: Mulberry, Fla.; capacity: 70,000 tons; value: $3 million.*

Swift & Co.
Location: Fla.; capacity: double to 150,000 tons.

Western Phosphates, Inc.
Location: Garfield, Utah; due in: spring; value: $250,000.

Synthesis gas

Du Pont Co.
Location: Belle, W. Va.; value: $4 million.

Tall oil fractionation products

Arizona Chemical Co. (Cyanamid)
Location: Panama City, Fla.; due in: first half of year.

Tall oil intermediates

Crosby Chemicals, Inc.
Location: Picayune, Miss.; value: $2 million; process: refining of waste products from pulp mills.

Tar acids

Allied Chemical & Dye Corp.
Location: Frankford, Pa.; due in: March; value: $150,000; process: tar distillation.

Forecast for '55

Terpene chemicals

The Glidden Co.
Location: Jacksonville, Fla., Valdosta, Ga.; value: $500,000.*

Tetrafluoroethylene

Du Pont Co.
Location: Parkersburg, W. Va.; capacity: 100% expansion of current facilities.

Textile chemicals

Moreland Chemical Co.
Location: Spartanburg, S. C.; valus: $350,000.

Titanium

Aero Metals, Inc.
Location: Boulder City, Nev.; value: $1 million.*

Cramet Co.
Location: Chattanooga, Tenn.; capacity: 6000 tons; due in: early year; value: $25 million.

Dow Chemical Co.
Capacity: 10 tons/day; due in: 1955.

Du Pont Co.
Location: Waverly, Tenn.; capacity: 7-8000 tons; value: $35 million.

Electro Metallurgical Co. (Carbide)
Location: Ashtabula, O.; capacity: 10,000 tons; value: $30 million.

Horizons Titanium Co.
Location: Stamford, Conn.; value: $600,000; process: electolytic.

Rem-Cru Titanium, Inc.
Location: Midland, Pa.; capacity: 7 ingot-tons/day.

Titanium Dioxide

American Cyanamid Co.
Location: Savannah, Ga.; due in: midyear.

The Glidden Co.
Location: Baltimore, Md.; due in: December; value: $10 million.

National Lead Co.
Location: St. Louis, Mo.; capacity: 36,000 tons; due in: July.

Toluene, xylene solvents, para-xylene

Sinclair Chemicals, Inc.
Location: Marcus Hook, Pa.; capacity: 18 million gal.; due in: March; value: multimillion; process: Udex aromatic extraction.

Uranium

Kerr-McGee Oil Industries
Location: Shiprock, N.M.; value: $3 million.*

Union Carbide and Carbon Corp.
Location: Paducah, Ky.; value: $1 billion.

Vitro Uranium Co.
Location: Salt Lake City, Utah; capacity: 50% increase; value: $500,000.

Vinyl acetate

Air Reduction Co.
Location: Calvert City, Ky.; capacity: 30 million lbs.; due in: late 1955 or early 1956*

Vinyl butyral interlayer

Monsanto Chemical Co.
Location: Springfield, Mass.; capacity: 50% expansion.

Vinyl chloride

Monsanto Chemical Co.
Location: Texas City, Tex.; value: $7.3 million.*

Vitamin B_{12} concentrates

Vern E. Alden Co.
Location: Milwaukee; value: $500,000; process: from sewage.*

Waxes

The J. I. Holcomb Co., Inc.
Location: Oakland, Calif.; value: $300,000.

Texas Eastman Corp.
Location: Longview, Tex.; several million lbs.; value: $3.8 million.

Wood preservatives

Koppers Co.
Location: Salem, Va.

para-Xylene

Standard Oil Co. (Ind.)
Location: Whiting, Ind.; capacity: 14 million lbs.; due in: January; process: hydroforming and separation by hydroforming.

Zinc oxide

Northwest Refining & Chemical Co.
Location: Spokane, Wash.*

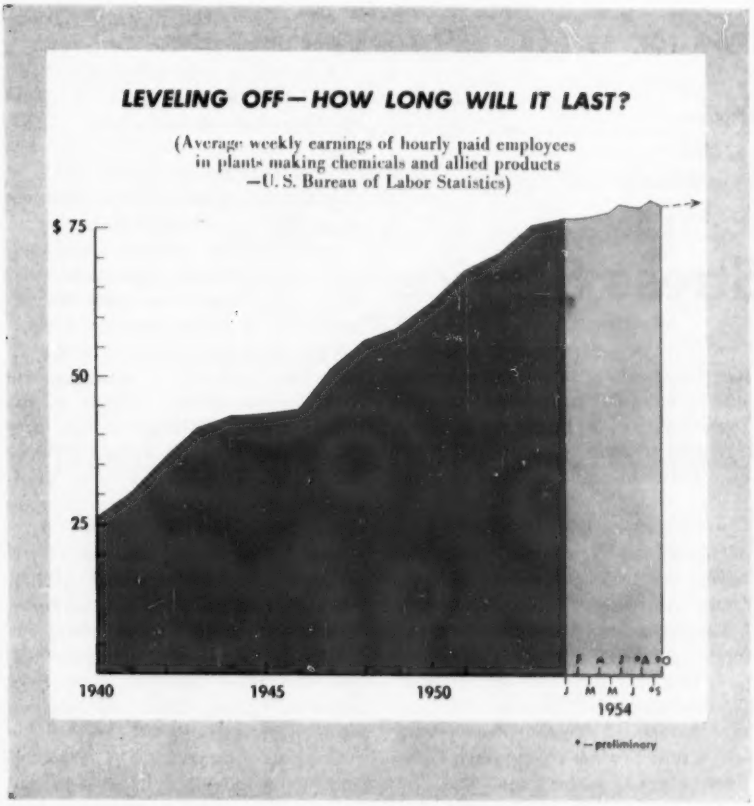
Zirconium

Allegheny-Ludlum Steel Corp.
Strip and other shapes for atomic energy application.

Carborundum Co.
Location: Akron, N.Y.; capacity: 150,000 lbs. (including hafnium); value: $2.5 million.

Zirconium oxide, stabilized

Zirconium Corp. of America
Location: Solon, O.; capacity: 60,000 lbs./month; due in: January; value: $350,000; process: newly patented.



Less Strife for Labor

FEWER labor unions in the field, each union somewhat larger in membership and more dignified in action—that's the outlook for organized labor in the chemical process industries in 1955.

It seems fairly certain that the CIO's two unions most active in chemicals and petrochemicals—United Gas, Coke & Chemical Workers, and Oil Workers International Union—will be able to agree on terms for merging in March. Delegates from both unions will meet in Cleveland at the end of February, and it's expected that they'll form a single strong union with nearly 200,000 members.

That new grouping might well become the dominant union in the chemical field, prod the present leader to take similar action. Torn by factional strife, AFL's International Chemical Workers Union may take steps this year to unite with AFL unions in related industries as a means of building up strength to meet stiffer competition from the CIO.

Harmony at the Top: In the background will be top-level maneuvers to merge AFL and CIO into an organization that would wield more power in national affairs. The no-raiding agreement signed last June has largely succeeding in stopping jurisdictional disputes among participating unions.

Independent unions in the chemical industry—of which United Mine Workers' District 50 is by far the largest—won't be taking part in the merger program. District 50 will be free to raid and be raided; and although its AFL and CIO rivals probably will be too busy with their consolidating programs to do much fighting for District 50 locals during 1955, chemical plants may be the scene of considerable strife of this kind in '56.

In bargaining tactics, too, the chemical labor unions are not expected to be particularly aggressive during 1955. There are signs that other industries may have considerable trouble on this front during the coming 12 months, with CIO's Auto Workers demanding a guaranteed annual wage, AFL's construction trades unions pushing more wages up into the $3/hour bracket. The chemical unions simply aren't big enough or strong enough to drive for those goals yet, but you can expect more sweeping demands from CIO's chemical locals after the anticipated merger.

Five-Cent Pattern: On wages, the chemical industry's pattern appears to be fairly well set for the coming year. With many of the two-year contracts signed during the past 12 months calling for 1955 wage boosts in the neighborhood of 4-6¢/hour (*CW, Nov. 27, '54, p. 26*), it's a good bet that other chemical locals will be willing to settle for a similar increase in new pacts and wage reopeners during '55.

Another trend likely to continue in 1955 is the decline in work stoppages. One reason for expecting this: the relatively moderate demands to be advanced by the chemical unions. Another reason is political: AFL and CIO—getting more deeply involved in national politics each year—are hinting for all affiliated unions to be on their best behavior in order to (1) make it easier for the new Democratic-controlled Congress to pass Taft-Hartley amendments desired by labor; and (2) win for the unions increased popularity that may help elect "prolabor" candidates in '56.

One even more cogent reason for betting on more harmonious labor-management relations in the chemical industry this year: these companies' increasing skill—coming from experience—in the art of winning union cooperation. In many plants, this factor may well outweigh all others.

SALES SIGNS FOR '55

Sales slope: slightly upward.
Biggest worry: competition amid plenty.
Top selling points: application know-how, prompt deliveries.
Salesman's outlook: more travel, more calls, more service.

Sellers Stress Service

SERVICE is the watchword that chemical sellers are passing along for 1955. Outstanding among all what's-ahead developments, service consciousness will occupy the thoughts of more sales managers over the next 12 months than in any previous period.

But if sales staffs have been alerted to the trend toward customer-coddling, it's in the spirit of challenge, not apprehension, that sales leaders are facing the years ahead.

These are the broad outlines of that future:

• Chemical sales should rise—top 1954 by 5-10%, depending upon who and where you are.

• Competition, too, will step up. As one chemical man put it, "The business is there—and it's good. But right now we've got to work like blazes."

• If anything, the immediate period ahead looks rosier than, say later in the year. Big factor contributing to this condition is the present state of inventories. Stocks on hand probably touched bottom a month or two ago; a pickup due to inventory buildup should start soon.

Biggest Selling Point: Lumping this increased sales-keen competition outlook, and recognizing that practically every item is in plentiful supply, most managers are both talking and acting to impress customers with service.

Typical efforts:

• More and better sales bulletins and technical literature. Convinced that customers are seeking more detailed product information, some companies are upgrading and supplementing their price lists to the status of product bulletins.

• New or enlarged technical service departments. Some organizations that previously considered nonsales representatives a luxury now recognize that service will make the difference between profit and loss in many cases.

• Shorter tie lines between service personnel and customer. Example: having the technical staffers work directly with district sales managers.

Emphasis on Know-how: Of all forms of service, application know-how looms as the most important in the coming period. As one sales manager concluded, "Just delivering your new product babies isn't enough today—you've got to nurse them."

Not only manufacturing, but alert distributors, too, are agreeing, finding that to maintain tomorrow's stepped-up pace, special attention must be given to new product development.

No isolated case, one West Coast distributor tipped his hand on his plans this way: "Our prime problem is to introduce new items effectively. We're setting up a new department, staffing it with top technical men who will pass information from producers along to salesmen and customers."

More, Better Calls: In order to give the customers what they want, look-ahead sales managers are concentrating on improving and stimulating their staffs. As a rule, the problem is no longer one of finding enough applicants for sales; it's more a matter of training the right type to do an aggressive job of meeting the competition.

One facet of this new aggressiveness is the all-out drive for more frequent and effective calls. Routes being tried:

• Tighter scheduling and allocating of salesmen's time.

• Installing sales office equipment to (1) analyze weak spots, (2) point up advantageous leads, and (3) reduce salesmen's paper work, thus freeing them for calls.

• Disclosing more facts to salesmen—heretofore confidential facts.

• More sales contests. Companies that seldom or never before attempted these special incentives are either introducing or considering the idea.

Upgrading Distributors: The distributor, like the company salesman, will likely receive closer scrutiny in the period ahead. Although a few producers are lining up a longer list of distributors (for small-volume products), prime emphasis now is upon distributor quality.

And, recognizing the increased pressure for knowledgeable selling, one maker declares its new attitude: "Distributors need help in selling our chemicals. Our technical representatives are now traveling with their salesmen, giving them all possible product information."

Cut-Rate Competition: The switch from an economy of scarcity to one of abundance is spawning a new breed of competitor that lacks experience and tends to cut prices.

Forerunners of what may become serious threats to established sellers:

• In fertilizers—there's an influx of trucking companies and others breaking into the field through the price-slashing route.

• In petrochemicals — new producers, not averse to grabbing a slice of business by slicing prices, are beginning to offer hot competition.

Promotion and Perspiration: With sales races now going into high gear, most chemical makers are maintaining or increasing their advertising and promotion budgets, with most increases allocated to specific product promotions.

However, with production capacity now from 2 to 4 years in advance of ordinary demand, the heaviest burden in years will be upon the salesman, who will now have to travel farther, call oftener, know more than he has had to for the last 15 years.

Pasticcio of Predictions

"You'll see a strong effort this year to introduce synthetic detergents into bar soaps."

—Vova Blinoff, American Alcolac

"The farmer's insecticide stocks are low, and most price-cutting marginal operators are no longer with us."

—Mel Goldberg, Pesticide Advisory Service

"Packaging will take on new importance in automobile specialties this year."

—H. G. Lederer, Hollingshead

Specialties: Air of Assurance

AS IN the chemical industry as a whole, it is difficult to find specialties manufacturers who don't view 1955 with optimism. The vague pessimism that threaded through predictions for 1954 is gone. Instead, there is a confidence that, although there will be brisk competition, 1955 holds few real fears for alert manufacturers.

The predictions of a "stable economy" encourage makers to feel there will be secure markets for established specialties. Further, there are plenty of bright new products ready for introduction this year. There appear to be no major threats of sales-curbing legislation.

Here's what to look for in some areas of specialties manufacture:

Aerosols: All is optimism here. A 25% growth in sales has been forecast—nearly 250 million units will sell in '55. There will be the usual raft of new products, but most significant changes are expected in package construction. Glass containers will attract more manufacturers—only one firm makes them now. Too, '55 will bring the introduction of all-plastic containers, perhaps within weeks. Two different types will appear first, one based on nylon, the other on melamine resins. These are the developments of relatively small companies. But it is no secret that makers of tinplate containers are probing the plastic possibilities, too.

Automotive Specialties: The estimates of new car production neighboring 5.5 million this year insures a steadily growing market for such standard specialties as waxes and polishes, chrome cleaners, radiator compounds, and the like.

New designs that appeal to the monied buyer—models with plastic tops, more glass, accessories like white-wall tires—will create demand for specialties for their upkeep.

A campaign that may get attention in '55: a drive to persuade auto owners to have frequent (perhaps yearly) changes of hydraulic fluids.

Insecticides: When the government began, late last month, accepting bids for 25 million lbs. of 75% DDT wettable powder, many insecticide makers saw the action as more solid evidence that the "lean years" were over. The insecticide business, slumping for two years, looks better for '55. Makers are not entering this year with overlarge inventories. Farmers aren't stocked up, either—they were cash-short in '54, bought only for their immediate needs.

A continuing rise in household insecticides seems likely. Perthane and Strobane, two new insecticides with top-drawer antimoth properties and well suited for aerosol use, will likely be important in '55.

Paints: Continued activity in building—both home and industrial, and high buying power for those intending to redecorate, indicate a good year for the paint industry. Prospects for rising sales should stimulate development of new coating materials.

Polyurethane and polyester finishes, already in use in Europe, hold promise as coating materials here. They will be a major project for '55.

The fight between butadiene-styrene, acrylic, and polyvinyl acetate paints is getting hotter—new products based on all these are expected, with no one product overshadowing others.

Cost-cutting procedures, to hold prices even in spite of rising production costs, are getting plenty of attention. Use of isophthalics—to make lower-cost, nonaqueous vehicles—is one typical approach.

Soaps and Detergents: Sales will rise in 1955, largely because of population increases. Here are some other likely happenings:

- Liquid dishwashing detergents will continue to boom. A lower percentage of active (but more effective) ingredient will go into these.
- Interest in synthetic detergent bars will be revived, but it is doubtful if they will be nationally distributed by year's end. Synthetics will be used to bolster effectiveness of bar soaps, too.
- In contrast with the liquid syndets, it's a possibility that powder syndets will be made more concentrated.
- Cuts in raw material prices are expected, but they'll be offset by increased shipping and handling costs.

Legislation: For the most part, legislation isn't a big worry this year. The Miller amendment, enacted last year, will be felt for the first time in '55, but it isn't expected to hobble many firms. Makers of home insecticide specialties aren't fearing any important changes in laws concerning their products, but higher registration costs loom as possible headaches.

Hydraulic brake fluid makers face the prospect of more states enacting regulations concerning the fluids. And paint makers, too, see chances of more "no-lead-permitted" laws (but these should prove of little hardship).

In sum, 1955 for specialties makers will be a year of both challenge and promise.

1951
Most chemicals tight; sales strong

1952
Market generally in balance;
some basic chemicals still relatively hard to get

1953
Chemical output paces consumption,
but sales at high levels

1954
A few items still tight, most in balance;
the year winds up better-than-average

1955
Practically no shortage problems; a more-hustle, less-bustle year—but prosperous.

Markets: Not Best, But Better

GIVEN a year of peace—both world and economic—the upcoming 12 months should be a period of chemical plenty. Consensus in the nation's marketplace is summed up tersely: few, if any, shortage problems ahead for consumers; hard-sell year for producers.

General industry opinion, too, is that widespread price-slashing will be sidestepped in the match for markets. First-quarter tags will remain substantially where they are now, but look for a flurry of price activity in the second or third quarter. End result for the year: slight increase over '54 prices.

The broad strokes underlining the new year's more hustle, less bustle aspect emphasize this belief: although 1955 won't be the best year, it should top '54's brisk rate—if only by 5-10%.

Detailed Digging: Here's *CW*'s latest West to East tally:

"Better than the over-all U.S. picture"—that's the way West Coast marketers see the outlook in their section. Rate of residential building is greater, for instance, which means market strengthening, particularly in paints, resins, oils, and other products tied closely to population growth.

Phenol, pesticides, glycols, ethyl alcohol, and hydrochloric acid supplies will be more ample. And consumers should have little difficulty obtaining all the sulfuric acid, chlorine, polyethylene and phosphates they need. (About the only item expected to be tight: selenium.) Few gluts in sight, though. New plants will take many chemical raw materials.

A swing through the Southwest reveals a similar expectation of supply ampleness, a like absence of pessimism on the part of producers. One alkali maker, for example, reports his '54 sales ran a good 15% ahead of 1953—and the company is setting goals for '55 ahead of last year's.

Chlorine and caustic will be in balance: municipal requirements for the former will jump about 10%. Oil refining needs for caustic should average out to '54's consumption rate. A steady price picture is seen for formaldehyde, acetic acid, methanol, alcohols, and butyl acetate. Tabbed for further hikes: salt cake (sodium sulfate).

Here, as in many other areas of the country, ag chemicals haven't been doing so well because of sales-buffeting climatic conditions. Several pesticide makers won't be around to see how '55 turns out.

Middle Markets: Market followers up and down the wide mid-U.S. section parrot comments heard elsewhere: "Ample supply of most everything, but no surfeit expected." "No sign of a slump." "Business 10% better in '55."

More specifically, the Midwest will have no oversupply of phosphates, even with new capacity coming in; plenty of sulfur, sulfuric, potash, resins, ammonia, other nitrogeneous products. Benzol, xylol, and toluol will continue in good shape—enough for all customers. There's a question mark on the latter, however. Government purchases (for avgas, TNT), could well throw the market out of kilter. But that holds true for most chemicals should battlefront needs arise; it's a footnote to all market observations for '55.

Farther East: In the more industrial Eastern and Atlantic Coast areas, the expected dearth of strikes will smooth the consumption and output bumps for about all chemicals already mentioned, plus these other items: ammonium sulfate, muriatic, nitric acids, fluorspar (for steelmaking). And increased tempo of consumer interest should forestall market-flooding of ethyl chloride, thiourea, metallic sodium, butyl alcohol, plastic materials, to name a few.

Industry Sum-up: Taken all in all, it appears that the new year adds up like this: price increases narrow; short items rare enough to be overlooked in the preponderance of more easily available (but not to the point of saturation) commodities. In essence, a plentiful, yet prosperous year, for both chemical makers and users.

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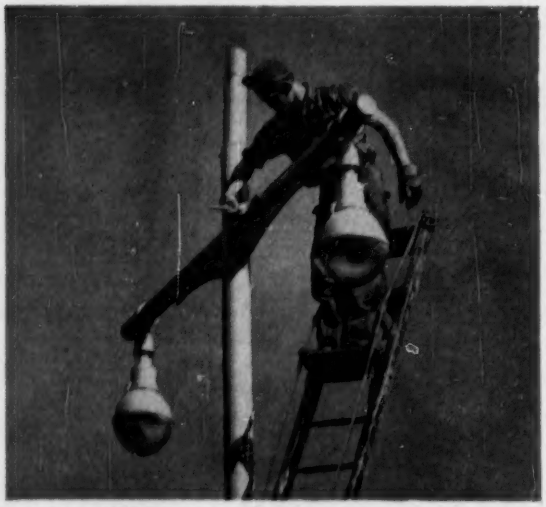
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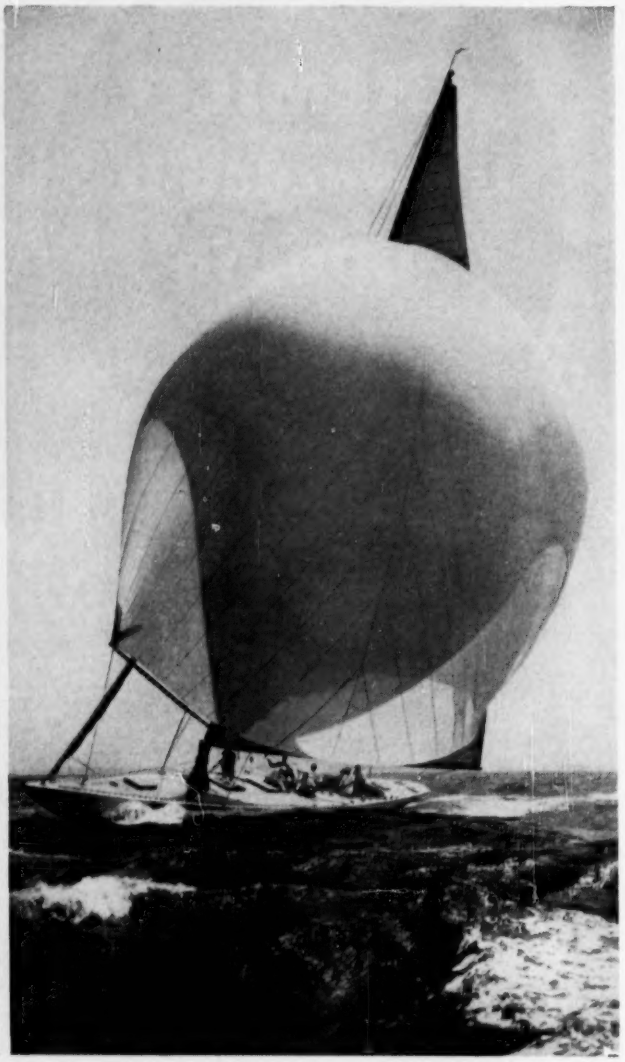
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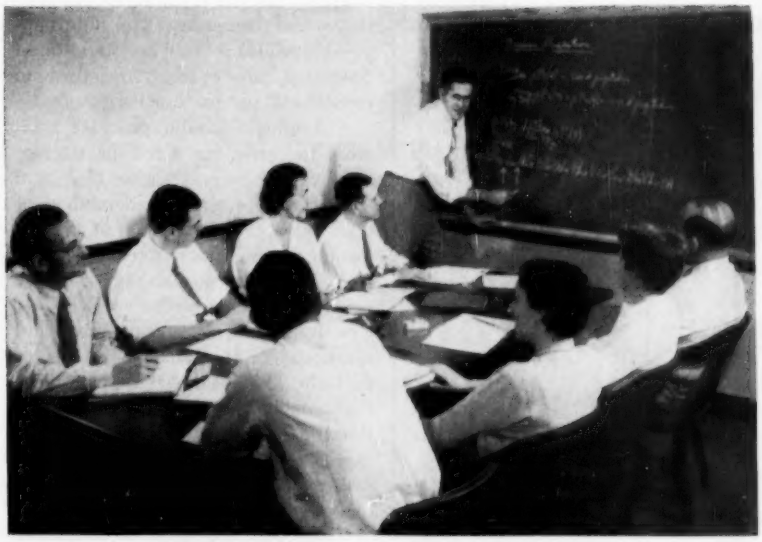
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PARAFLOW	PETROHOL 99	PETROHOL 99
PARAPOID	JAYSOL	JAYSOL
PARADYNE	Secondary Butyl Alcohol	Iso-Octyl Alcohol
PARATAC	Secondary Butyl Acetate	Decyl Alcohol
PETROHOL	Isopropyl Acetate	Denatured Ethyl Alcohol
Methyl Ethyl Ketone	Acetone	Tridecyl Alcohol
Dewaxing Aid	Methyl Ethyl Ketone	Dicyclopentadiene
Ethyl Ether	Dicyclopentadiene	Isoprene
Isopropyl Ether	Ethyl Ether	Butadiene
Reference Fuels	Isopropyl Ether	Ethyl Ether
	Naphthenic Acids	Isopropyl Ether
	Iso-Octyl Alcohol	Tetrapropylene
	Decyl Alcohol	Tripropylene
	Denatured Ethyl Alcohol	Aromatic Tars
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		Acetone
		Methyl Ethyl Ketone

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CYANAMID'S PROTEIN PIONEERS:* In new methods, the means of research.

Mounting the Attack

Armed with new weapons of synthesis, analysis and purification, protein researchers were preparing this week for an assault on a storehouse of potentially remunerative new products.

Hormones are the first target of this offensive, but antibiotics, antibacterials, blood plasma extenders and synthetic fibers are within range.

That's a far cry from the days, only recently past, when mere mention of the word "protein" would leave chemists with a helpless feeling. A string of advances in this field, culminating with the recent characterization of ACTH's structure by a team of American Cyanamid researchers (*CW, Nov. 20, '54, p. 86*), has provided industry with the means of effective protein research.

Cyanamid's chemists split ACTH into eight peptide chains, the most abundant of which—β-ACTH—contains 39 amino acids. The logical termination of their work would be a synthesis of this structure. That feat has not yet been attempted.

Reason: peptide synthesis by conventional methods involves a tedious, drawn-out procedure in which the growing chain must constantly be shielded with protective groupings.

The only synthesis standing a good chance of commercial success would be one in which the chain is built by the addition of one amino acid after another, with no auxiliary steps.

Thus far, such a method is a wish—but not wholly unrealistic. New peptide synthesis techniques developed by Cyanamid probers represent a long stride in the proper direction.

Unique among the new Cyanamid synthesis contributions is a method, utilizing tetraethyl pyrophosphite, that introduces a fundamental change in traditional peptide synthesis concepts. The usual way to make peptides is to form a derivative of the acid portion of the amino acid, then couple this with the amine of another acid.

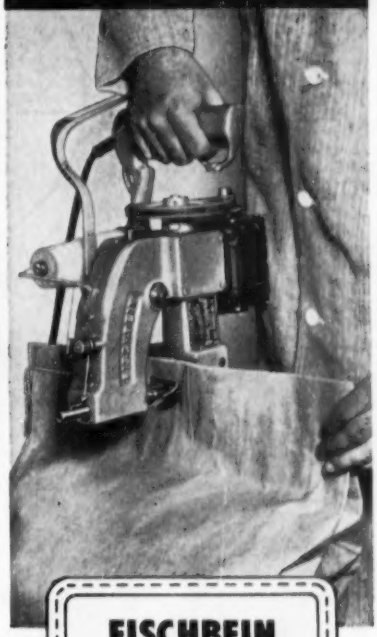
The phosphite technique permits the chemist to make derivatives of either the acid or the amine, or it may be applied directly to a mixture of amino acid derivatives.

The phosphite method—credited to Cyanamid's George Anderson and Richard Young—is considered by many to be the biggest single contribution to peptide synthesis in years.

The use of chlorocarbonates in peptide synthesis—as worked out by Cyanamid's James Vaughan, Jr.—represents a second big advance over previous techniques in simplicity and versatility.

* Clockwise from Paul Bell *(at blackboard)*: Stewart Wilson, Nancy Shakespeare, E. A. Eigner, Jackson English, Robert Sheperd, David Davies, Katherine Howard, Selby Davis.

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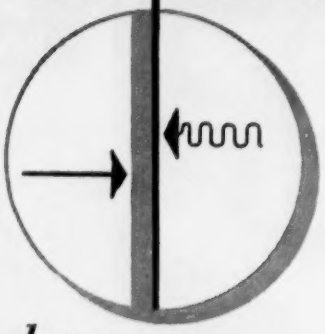
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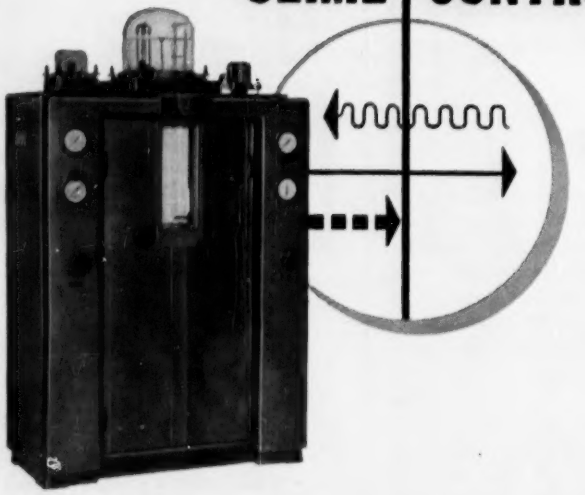
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CD-39

Synthesis methods such as these, coupled with the countercurrent purification and degradation procedures applied to ACTH by Paul Bell and Robert Shepherd, are opening the door to commercial products of the future.

• Synthetic insulin provides sufficient incentive for a serious attempt to substitute a synthesis for biological extraction, the established method of production. Total synthesis of the big insulin molecule is not commercially likely; but the probability of active fragments is now relatively good.

• By the same token, active and synthesizable ACTH fragments are not unlikely. There is the strong possibility that valuable hormone activity is centered in a small part of the molecule.

• New protein hormones also are a distinct possibility. Better research tools should bring increasing numbers of researchers into the protein hormone picture. Anyone who tries to synthesize ACTH (or its components) will come up with a host of protein molecules that doubtless will be screened for many different types of activity. Past experience indicates that rewarding surprises are in store.

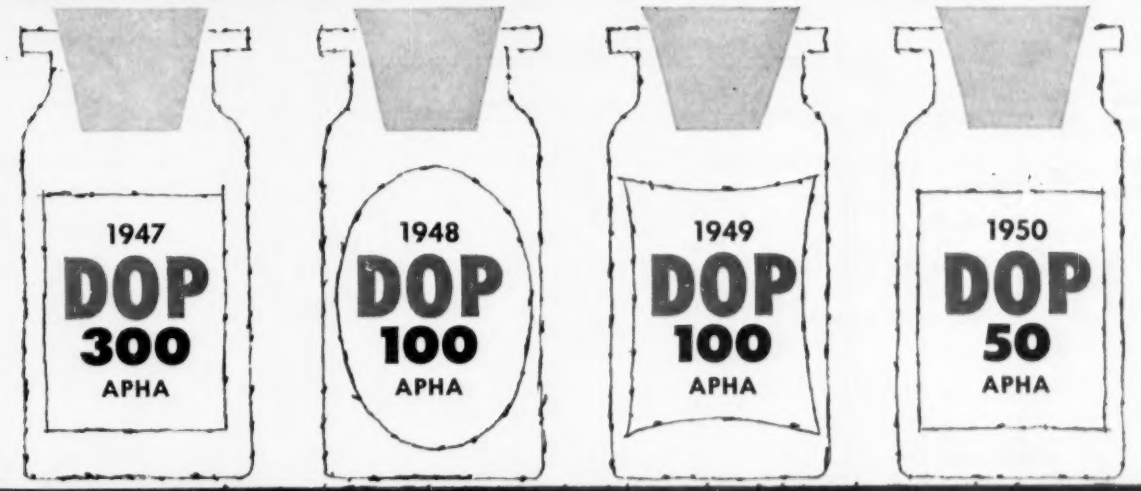
• Antibiotics such as gramicidin are peptides that are even now generating synthesis research. Many fragments of the former (a cyclic decapeptide) have been prepared and tested for antibiotic activity. Recently, some of these experiments have looked promising.

• Other protein-type antibiotics as tyrothricin, bacitracin and polymixin also offer incentive for research aimed at forging commerical syntheses. An expansive market, moreover, would doubtless exist for a simple peptide antibacterial agent. Unnatural configurations of amino acids are now under investigation in this connection at Columbia University's College of Physicians and Surgeons (New York).

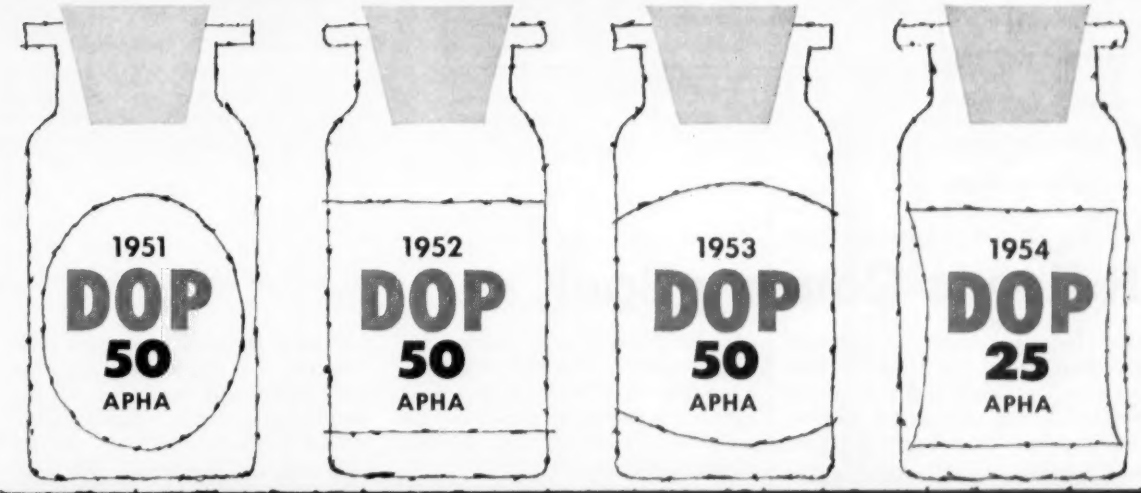
• New protein fibers are not to be overlooked. Fiber-forming polymers of single amino acids and nonspecific mixtures (for which exact structures are not known) are already under investigation by Courtaulds, Ltd.

All told, a growing legion of industrial and academic researchers are involved, one way or another, in protein research. Standouts among the former are Merck and Armour in addition to American Cyanamid. Their efforts may not pay quick dividends, but the odds on a profitable outcome are improving each day.

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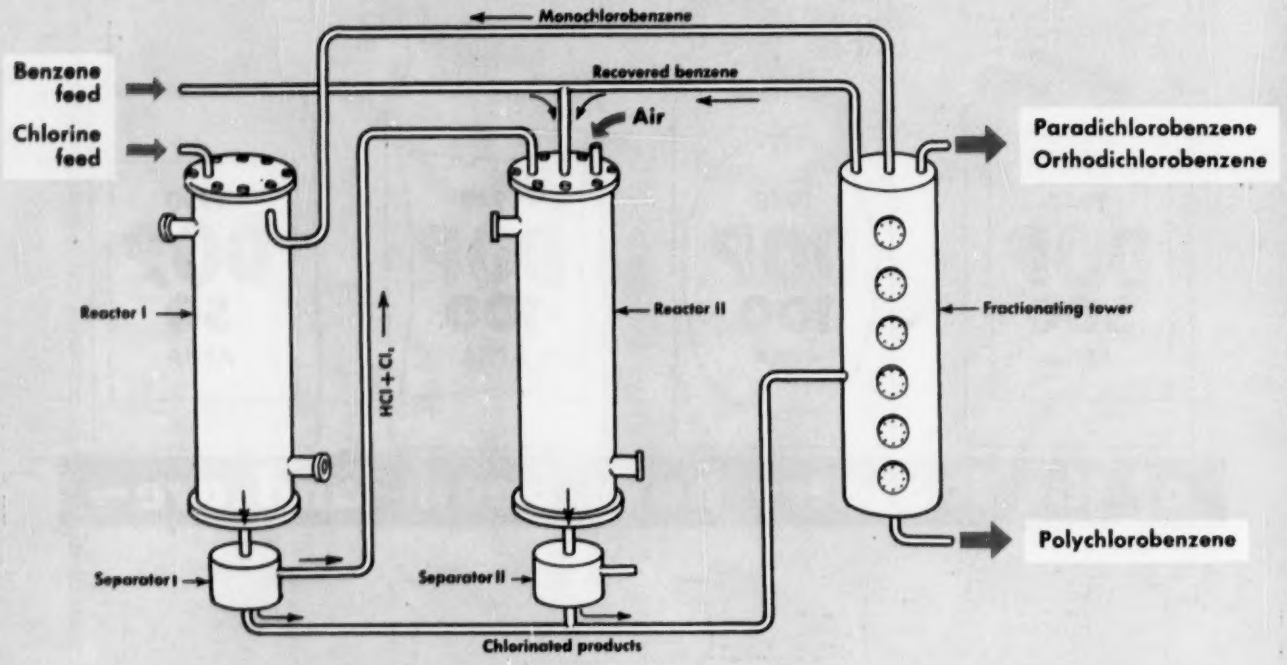
The first Eastman specifications in 1948 called for production of a 100 APHA dioctyl phthalate. Then in 1950, this was lowered to 50 . . . and in 1954, to only 25.

Eastman has led the way in the steady improvement of DOP quality. New production and refining methods have produced in today's Eastman DOP a truly high quality dioctyl phthalate whose combination of low color, low odor, low acidity, high heat stability and high ester content is unsurpassed.

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It Keeps Coming Back

Last fortnight, chemical engineers gathered around the bas-relief bald eagle in the Grand Ballroom of the Waldorf-Astoria (*CW, Dec. 25, '54, p. 40*), listened to a number of papers on the process industry, noted one in particular. In this talk, titled "Utilization of By-Product Hydrogen Chloride as Chlorinating Agent," Aaron Teller of Fenn College (Cleveland, O.) discussed—for the first time publicly—his modification of the Deacon process of production of chlorine from by-product hydrogen chloride.

Especially interested were engineers from Du Pont, Allied, and Columbia-Southern; and it's an odds-on bet, that the talk will soon attract the attention of other large chlorine producers and users. Reason: the process offers a 100% increase in chlorine utilization efficiency over standard chlorination procedures.

Balancing Out: The process further provides producers with a way to get chlorine—from the large and readily available stockpile of by-product hydrogen chloride—without having to pay for caustic they can't use and don't want. On a long-range projection, this could help even out the chlorine-caustic imbalance.

Presently, by-product hydrogen chloride poses a problem. Recovery requires a sizable capital investment for equipment; and the resultant product, though it accounts for more than 50% of muriatic acid output in the U.S., is of such a low concentration that transportation over long distances is economically infeasible. This means local gluts, which can, however, be eliminated by a more complete utilization of chlorine.

Of more immediate significance to producers of substituted chlorinated hydrocarbon intermediates and end products is the assertion that this process will cut in half the amount of chlorine needed for chlorination of hydrocarbons (by substitution), will eliminate the need for recovery and disposal of by-product hydrogen chloride. Too, it is claimed, the operation lends itself to easy control, permits the use of smaller reactors, offers flexibility in feed streams (the HCl/air ratio can be varied, and the process will work on "impure" HCl from an adjacent plant) and still maintain yields of 88-94%.

In dollars and cents, Teller figures that all of this will save producers $9.30/ton of substituted chlorine plus the investment for recovery equipment. And the secret is all in the catalyst.

Catalytic Key: In its original form, the Deacon process spelled out a way to make chlorine from hydrogen chloride by oxidation with air over a cuprous chloride-on-brick catalyst. It first appeared in the 19th century, faded out before 1900, but keeps reappearing in improved versions.

One of the major drawbacks to the Deacon is the low catalyst efficiency, which necessitated high temperatures (450-600 C); but at temperatures



FENN'S TELLER (above) is responsible for the latest attempt (left) at making the Deacon process a commercial success. His trick: keeping the copper catalyst dispersed on a porous alumina-base carrier in order to provide a large number of active foci, and to spur the reaction along.

above 250 C conversion drops back rapidly. A thermodynamic analysis indicated 100% conversion was obtainable only below 180 C.

In his version, Teller retains the copper catalyst, but improves efficiency by using a porous carrier to keep the copper dispersed. By depositing copper oxylate on an alumina base, he was able to drop operating temperatures to 245-250 C, obtain 90% conversion of the hydrogen chloride stream. Actually, Teller combines the modified Deacon process with a straight hydrocarbon substituted chlorination, fashions a continuous vapor-phase reaction that will enable producers to recover hydrogen chloride by-product from one phase of the chlorination, mix it with incoming chlorine feed in one reactor, and use it as the chlorinating agent in the second reactor. And it's feasible (though unproved as yet), Teller figures, to use straight hydrogen chloride as the sole chlorinating agent.

Operational Fledgling: The principal drawback to the Teller operation is that it is still untried at all on a large scale—in fact, even on a small scale with any hydrocarbon other than benzene. Teller can't foresee any problems with corrosion or other trouble makers, but he does want to set up a pilot plant.

He hopes, for instance, to probe the feasibility of moving bed catalysis, which would eliminate the present need for a stand-by rector (while Reactor II is regenerated). He hopes also to explore the possibility of using his dispersed copper oxide catalyst in a straight Deacon setup.

Before making any capital investment, of course, chemical companies will want to see more process data. For there have been over two dozen patents granted in the past few years that are aimed at improving the Deacon catalyst, another two dozen concerned with other ways of getting chlorine without concomitant caustic.

Hercules is already on the brink of commercializing such a process (*CW, Jan. 19, 1952, p. 48*) and others are utilizing by-product hydrogen chloride —on varying scales. But there's never any lack of interest in a new garb for Deacon.

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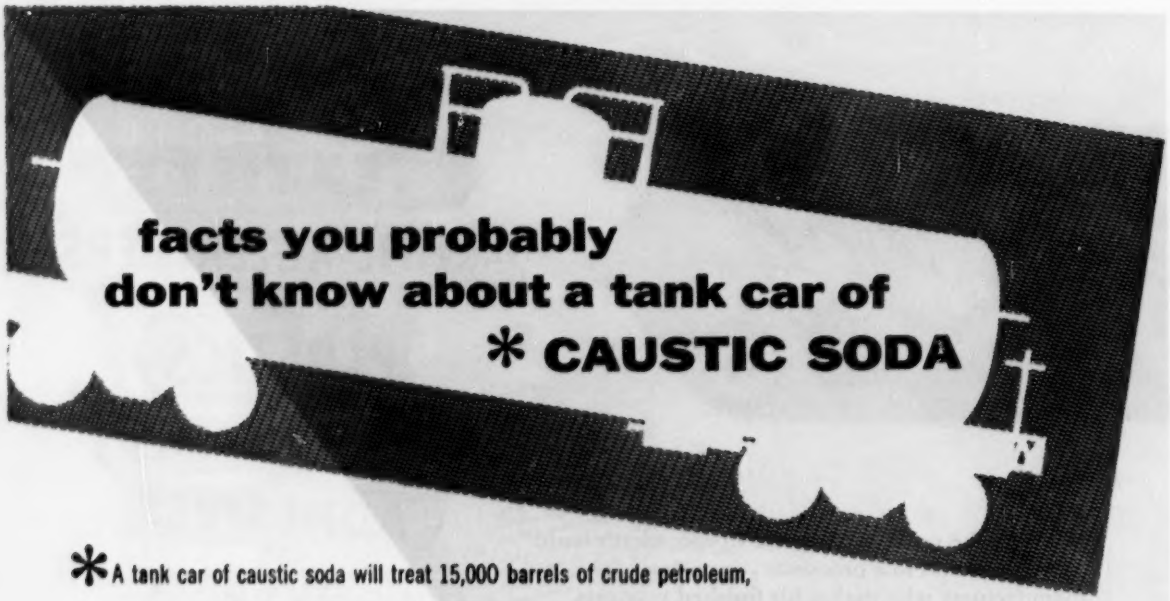
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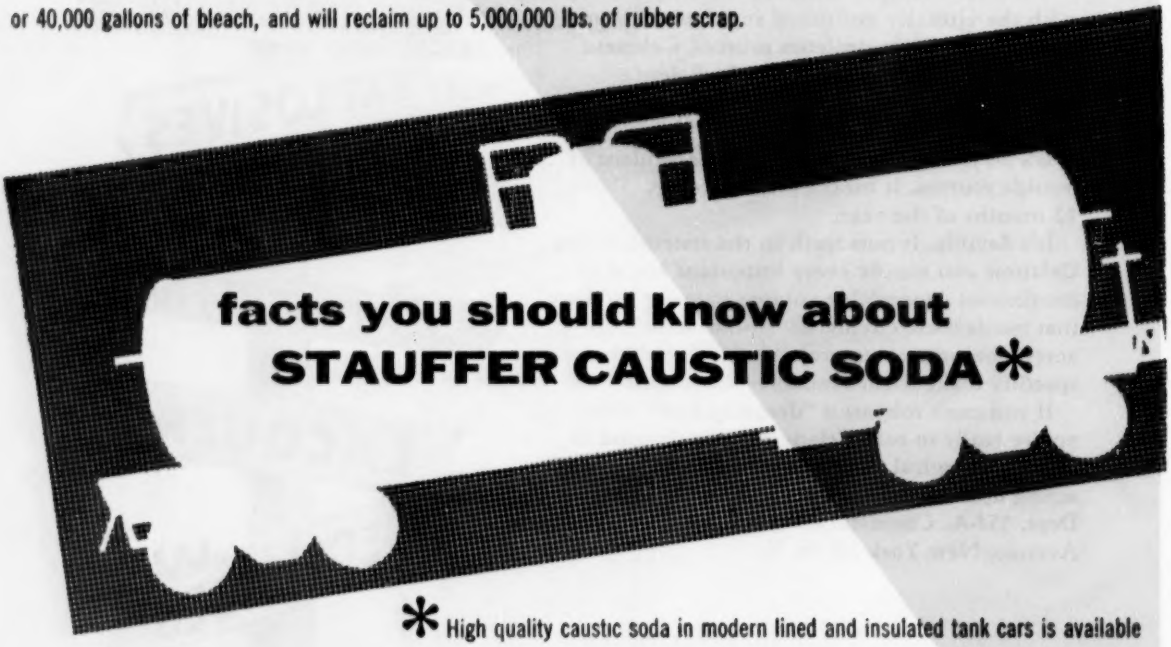
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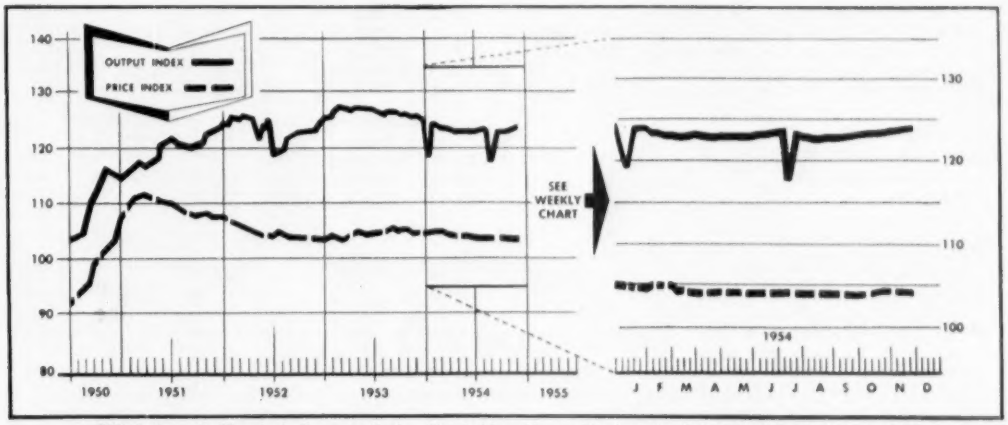
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MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries
CW Price Index—Basis: Weekly Prices of Sixteen Selected Chemicals

MARKET LETTER

When straws are discernible in a breezy market, it's not too difficult to determine which way the wind is blowing. Thus the new, advanced prices on crude domestic naphthalene just posted by a major seller, were foreseen earlier *(CW Market Letter, Dec. 25, '54)*.

Factors exerting the upward pressure on domestic material include: lower volume and higher prices of imported 78° naphthalene; pepped up demand from consumers spurred by realization that domestic tag hikes were imminent. Here's the latest crude tank-car schedules: 74°, 5½¢/lb. (up 1¢); 78° now 6¼¢/lb., an increase of 1¼¢. The c.l. price on the latter is currently pegged at 6¾¢, up from the previous 5½¢, while l.c.l. quantities cost 1¼¢/lb. more, an advance to 7¢/lb.

•

It hasn't happened yet, but trade talk is that nickel salts makers are poised to announce an upward revision of prices. Resellers, of course, have been asking—and getting—premium prices for some time on the little nickel derivatives available. Tightness in this market is a reflection of conditions surrounding the metal.

Scarcity of nickel—which was boosted 4½¢/lb., to 64¼¢, a few weeks ago *(CW Market Letter, Dec. 11, '54)*—is attributed to the government's hard stockpile buying.

•

Now practically all buyers of cellulose acetate molding compounds are being offered the same lower prices. Hercules Powder, the third major producer, reluctantly posted its sharp reductions to meet earlier ones announced by Eastman Chemicals and Celanese.

Competition has been cutting, and the new Group Three (dense colors and virgin black) prices (e.g., l.c.l., 36¢/lb.), merely gives official cognizance to the quotes that were being made.

•

Despite protestations by many benzol sellers, observers are willing to make a small wager that prices are in for a dip, albeit a temporary one. The benzol market, at the moment, can best be described as being in an "unsettled condition." The rocking factor: spurts of low-cost imported material.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	126.0	125.5	124.5
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.4	104.3	105.1
Bituminous Coal Production (daily average, 1,000 tons)	1,475.0	1,463.0	1,383.0
Steel Ingot Production (1,000 tons)	1,846.0(est.)	1,726.0(act.)	1,706.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	375.0	366.5	267.1

MONTHLY INDICATORS—Trade (Million Dollars)	Manufacturers' Sales			Manufacturers' Inventories		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	$23,377	$23,626	$25,010	$43,773	$43,668	$47,044
Chemicals and allied products	1,717	1,735	1,643	3,025	3,092	3,140
Paper and allied products	731	742	738	1,047	1,026	1,044
Petroleum and coal products	2,079	2,080	2,062	2,766	2,760	2,750
Textile products	1,043	1,054	1,038	2,331	2,361	2,614
Leather and products	322	331	243	570	572	577

At least one coke-oven benzol producer, however, professes unconcern, tells *CW* his first-quarter price will continue at the current 40¢/gal. level (tanks).

Marketers of petroleum-derived benzene, too, have a finger on the restless situation. Their prices, of course, will be influenced by the coal-tar material's final peg.

•

In the nonferrous metals market, copper prices remain exceptionally firm at the 30¢/lb. mark. All customers, however, can't get all the refined copper they want—there's a dearth of material currently available. Some producers report their entire January output is in a sold up position.

Odds are even, though, that supplies will ease within the next few months. Already U. S. production is above the level hit prior to the August-October strikes at mines and refineries (*CW Market Letter, Aug. 28, '54*). Foreign production, too, is higher, and holding to near-record rates.

That the copper situation is better, as far as output is concerned, is further underlined by the Business & Defense Services Administration's writing finis to the program of channeling copper from stockpile to shortage-hampered industrial consumers (*CW Market Letter, Oct. 23, '54*). A total of some 40,000 tons was diverted by BDSA during the strike period.

•

That old trouble-causer "prices slightly higher West of the Rockies" is bobbing up again. Some Eastern producers, reluctant to absorb freight, and with profit margins pared by keener Eastern competition, are reviving the two-price schedule setup—one for the East, one for the West. That's causing friction between Eastern home office sales managers—who are charged with making a profit—and their Western deputies who maintain that the higher prices curb development of the Western market.

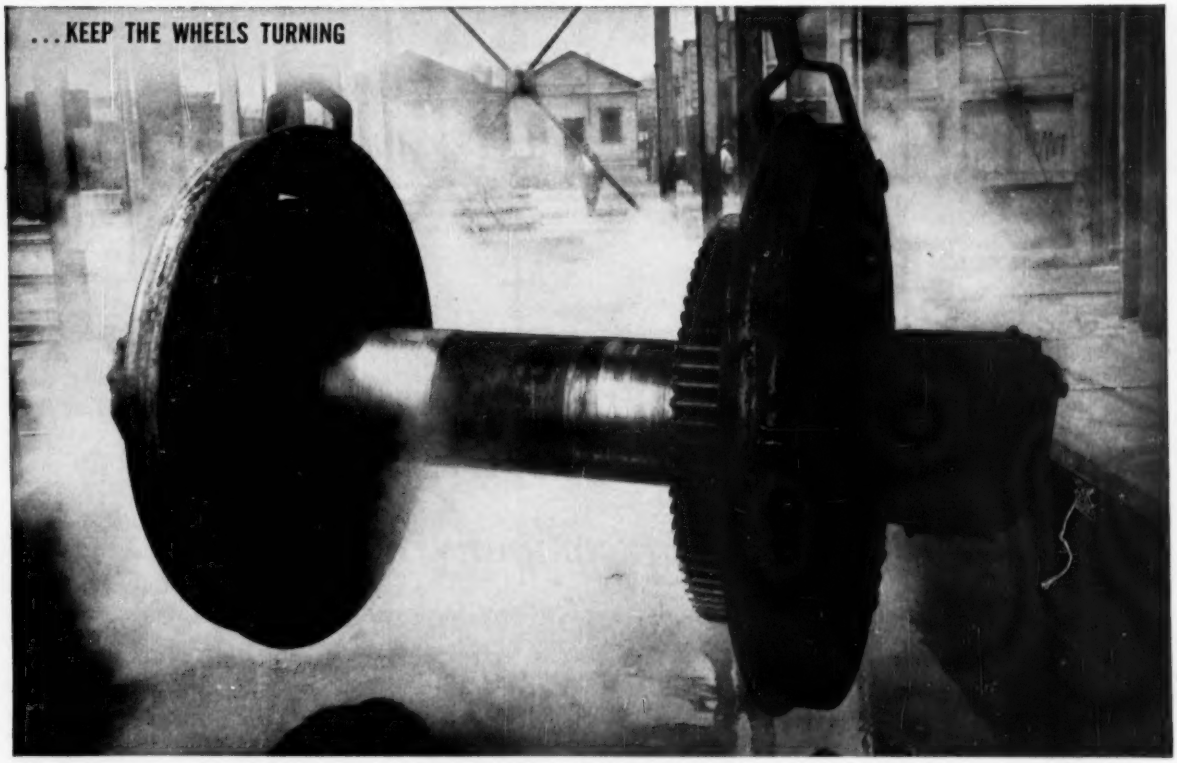
Last week's formaldehyde cut in the East—from $3.45 cwt. to $3, tanks—with the West's left at $3.95, is a case in point. And it's the pivot of a lot of East-West discussions this week.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 27, 1954

UP

	Change	New Price		Change	New Price
Coconut oil, crude, tanks, N.Y.	$.00125	$ .13375	78°	.0125	.0625
Lemongrass oil, cans, dms.	.15	2.65	Tall oil, crude, tanks, works	.0025	.0225
Naphthalene, crude, dom., tanks, frt. equald. 74°	.01	.055			

All prices per pound unless quantity is stated.



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A message to CHEMICAL INDUSTRY MANAGEMENT

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So it becomes increasingly important for you to seek every possible economic advantage when you select a chemical supplier.

Here, for example, are a few things to look for, when deciding on a source for caustic soda, chlorine, and other chemicals:

1. Supply security. How flexible are your supply lines? For instance, a supplier with plants located on deep water may be able to offer you a choice of rail or water delivery. This can insure you steady supply, in case of rail service interruption.

2. Engineering help. A supplier's engineering staff can often be valuable to you when you are setting up a new chemical process or caustic and chlorine handling systems—not only with advice, but with actual design assistance.

3. Smooth processing. You'll find it helpful to work with the supplier's technical service men who visit you periodically. Often these men can spot potential problems and ward them off before they cause you trouble.

4. Safety programs. Your men can benefit from safety suggestions offered by your supplier. You should have on tap the latest in safety equipment, plus up-to-date information on safe handling of chemicals.

5. Economy. Choose a supplier who wants to help you cut your operating costs; who will go all the way with you in arriving at the best, most advantageous method of shipping and handling for your conditions.

6. Experience. Above all, choose a supplier who is familiar with your industry. It takes years of experience to acquire an understanding of the problems you face, and the know-how to help you solve them quickly and economically.

Are you getting your fair share of these strategic purchasing advantages?

Many of our customers in the chemical industry feel that they get these advantages in buying from Hooker, a supplier of basic materials to the chemical industry for fifty years.

In the light of the growing importance of these factors, isn't this a good time to review your policies on sources of chemical supply?

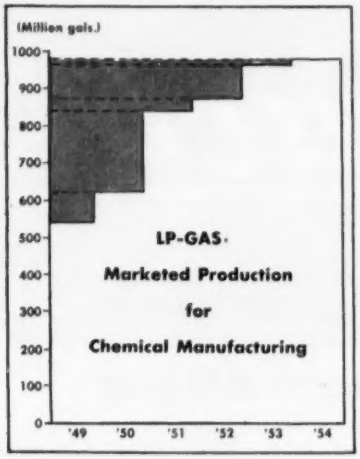
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Shorter LPG Step-up

Sales of liquefied petroleum gas (LPG) during the past year racked up another record with a heartening edge in volume over 1953. Quantities funneling into manufacture of chemical commodities continued to increase, but the step-up over '53 was somewhat less than that noted in the past (see chart).

That, in essence, is the chemical industry angle of a Phillips Petroleum report* on LPG (propane, propylene, butane, butylenes, etc.), out this week. The authors: George Benz, Paul Tucker, W. F. DeVoe.

Total LPG sales for 1954, say they, will likely hit a near-5134 million gal., or 4.1% over the previous year. The chemical-use category, on the other hand, will tally to an estimated 977 million gal., or approximately 1% better than '53. Most of the latter's increase is attributed to the upturn in demand during the final quarter.

Chemical manufacturing is not the largest LPG outlet, of course, but the gas is an increasingly important raw material. One generally accepted estimate is that petroleum and natural gas sources progenerate 25% of the total quantity of chemicals currently being produced in this country, with the major portion coming from LPG hydrocarbons.

While chemical use last year registered the smallest gain, other LPG consumers fared differently. Gas manufacturing (utility use) and synthetic rubber components suffered declines; gaining in '54 were industrial and mis-

* Prepared by the company each year since 1928.

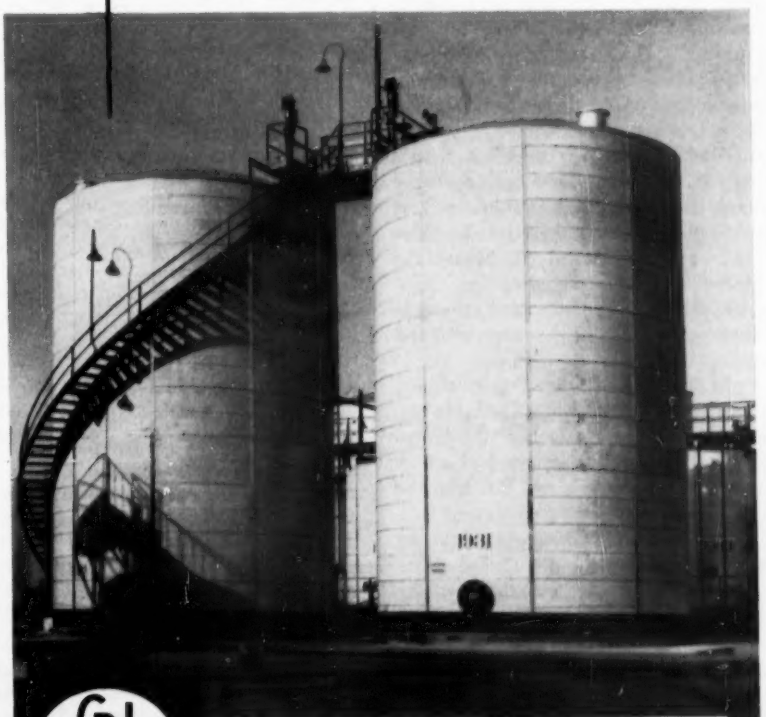
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cellaneous sales. Up, too, was domestic and motor fuel use of LPG. The latter consumed more than 3.2 billion gal., compared with '53's 2.98 billion.

Rundown on other LPG uses:

• Industrial and miscellaneous application totaled some 382 million gal.—up 2% over 1953. Because of natural gas pipeline extensions or increased pipeline throughputs, the industrial LPG load itself was down, but hikes in miscellaneous uses more than offset the industrial loss.

• Sales of LPG for gas manufacturing is estimated to be 208 million gal. —some 6.5% under the previous 222.4 million.

• On a steeper slide—nearly 19% below '53's mark—was consumption in synthetic rubber components, which accounted for about 317 million gal. of LPG. The reduction resulted from the substantial cutback in synthetic rubber output authorized by the government. The lower figure bears out an industry expectation that '54 consumption would fall short of '53's 390.5 million gal.

Chemical Gas: Petrochemicals as a group, according to the analysis, made a much greater gain during the year than the 1% increase scored by sales of liquefied petroleum gas. Most of the general petro bettering is due to increased use of methane and ethane in turning out anhydrous ammonia and polyethylene.

Many LPG-stemmed petrochemicals were adversely affected by unhappy conditions in consuming industries. Textiles, for example, had a slow year. Weak too, during '54, was the market for synthetic alcohols and various antifreeze compounds, both big LPG outlets.

These demand drops on the whole, however, were slightly more than compensated for by LPG requirements of new plants.

Good Prognosis

This is the season for looking back and craning forward. Plastics, rubber and sulfur, to mention only a few, are subjects of a number of such statements.

A vigorously growing market for polyethylene and polyvinyl chloride should drive sales to new heights. Thus do plastic industry spokesmen, including Bakelite's President George Miller and American Agile's head, Dr. J. A. Neu-

Xtracts

USEFUL INFORMATION ABOUT REACTIVE CHEMICALS FROM THE DU PONT ELECTROCHEMICALS DEPARTMENT.

Sodium cyanide provides active nitrile group



Many a new development stems from the skillful use of an old and well-established technique. To introduce a nitrile group, for example, practical chemists have found economical Sodium Cyanide to be convenient and useful.

Products used in medicine and medical research are only a few of the many important compounds prepared through organic reactions involving the nitrile (CN) group introduced by sodium cyanide. Acetone cyanohydrin is used in the manufacture of methacrylate resins, and phenylglycine, formed by the reaction of sodium cyanide with formaldehyde and aniline, is used in the manufacture of indigo. With ethylenediamine and formaldehyde, sodium cyanide forms ethylene diamine tetra acetic acid, used as a sequestering agent.

Alkyl halides and esters react with sodium cyanide to form nitriles—a synthesis widely used in the plastics field. The nitriles, in turn, are the starting point for a number of reactions leading to amides, acids, imino ethers, orthoesters, and amines.

While opening up new methods in organic synthesis—particularly in the preparation of drugs and pharmaceuticals—sodium cyanide continues to be of major importance in other industrial fields. Its ability to form complex cyanides with heavy metal salts renders it widely useful in metal treating.

Dissolved sodium cyanide readily reacts with sulfur to form sodium thiocyanate. This reaction is the basis for the use of cyanide as a "sharpening" agent in the unhairing of hides. Sodium thiocyanate, in turn, reacts with organic chlorides to form thiocyanate esters.

High purity sodium cyanide is available from Du Pont in egg, flake and granular form. Find out how you can profit from using sodium cyanide in your manufacturing processes. Mail the coupon below.

Looking ahead with 1,4-Dichlorobutane

In the past, the scarcity of the alpha, omega aliphatic dichlorides has rendered many organic syntheses impractical. Now available in tank-car quantities, 1,4-dichlorobutane makes possible profitable commercial development of many of these syntheses.

The two chlorine atoms of 1,4-dichlorobutane are highly reactive, resembling those of benzyl chloride and allyl chloride. One or both of them may be replaced by thiol, cyanogen, amine, alkoxy, aryloxy or other groups, and the primary reaction products which result are themselves chemical intermediates with many and varied potentialities. The 4-chlorobutyl derivatives, for example, may be useful in Grignard and Friedel-Crafts reactions.

Another interesting intermediate—delta-chlorovaleronitrile—results when 1,4-dichlorobutane is reacted with sodium cyanide. *Saponification* of this product yields sodium delta-hydroxy-valerate, while *hydrolysis* leads to delta-chlorovaleric acid or delta-valerolactone.

Coupling two molecules of delta-chlorovaleronitrile with sodium sulfide gives bis-4-cyanobutyl sulfide, which can be oxidized to the corresponding sulfone, or reduced to give a diamine. Hydrolysis of bis-4-cyanobutyl yields a dibasic acid.

For complete information about 1,4-dichlorobutane, its properties and reactions, mail the coupon.

"Elvanol" produces tough, grease-resistant films

Ordinarily, you wouldn't expect a water-soluble product to be a source of strong, useful films. But "Elvanol" polyvinyl alcohol is the exception. Films made from it are greaseproof, and have high tensile strength, impermeability to gases, and resistance to tearing or puncturing.

These tough, transparent films have a low degree of adhesion to many other plastic materials, making them useful on molds to prevent sticking. The water-soluble "Elvanol" films can be used to package unit quantities of soaps, bath salts and detergent powders; weed killers, etc. Other uses include gas-tight wrappings for polished metal articles; greaseproof wrapping for fatty materials. The transparent, heat-resistant films can be heat sealed or sewed in packaging.

Note: We don't make "Elvanol" films, but if you want more information about a supply source, or about "Elvanol," just check coupon below.

New Epoxidation Technique for natural fats, oils and derivatives

Epoxidation in a *single-stage reaction* is a feature of a new hydrogen peroxide-resin technique developed in the Du Pont Laboratories. Hydrogen peroxide is activated by an exchange resin to increase its efficiency in epoxidation. This process simplifies conversion of natural fats and oils into useful derivatives.

The new method increases epoxy content; lowers by-product formation; eliminates preforming peracid; minimizes acid requirements; lowers residual unsaturation. The epoxy oils produced by this method are heat stable and have good viscosity characteristics.

For a detailed description of this efficient technique, just fill out and mail coupon below.

New Products

Promising Heterocyclic Compounds



PYRROLE

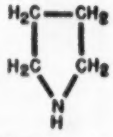
Boiling range.....126.5—131°C.
Sp. Gr. 20°/4°C. ...0.967—0.970
Refr. Ind. N20°/D...1.508—1.51

Pyrrole is slightly soluble in water, miscible with most organic solvents. It is an excellent solvent for cellulose triacetate and for caffeine.

Pyrrole is aromatic in nature, resembling phenol or resorcinol in the many substitution reactions which it readily undergoes. The α-carbon atom is the most reactive position, the hydrogen atom being readily replaced by groups such as aldehyde, acyl, carboxylic acid, alkyl, hydroxymethyl, etc.

Substitution at the other positions can also be readily effected, in addition to reactions which result in opening or expansion of the ring.

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Pyrrolidine is completely miscible with water and with most organic solvents. It is a basic cyclic secondary amine. Its basicity and wide range of solubilities make it of interest as a reaction solvent and catalyst.

It is a useful intermediate in organic synthesis, readily undergoing substitution, addition, oxidation, and ring opening reactions.

Substitution reactions generally occur at the nitrogen atom, resulting in the formation of tertiary amines. N-formyl, -acyl, -alkyl, -hydroxymethyl, -hydroxyethyl, -cyanomethyl, -cyanoethyl, and many other derivatives can be readily obtained.

For more information send for Bulletins Nos. 27 and 28.

CEN-11

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- ☐ Epoxidation with H_2O_2
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man, evaluate the upcoming year. Polyethylene consumption is expected to hit a record 240 million lbs., breaking 1954's sales-surging 200 million.

Polyethylene houseware sales, pacing heavier industrial uses, will continue at a beanstalk growth rate. Miller opines that this one outlet alone in '54 tripled the previous year's 12.5-million-lb. polyethylene take. And within five years consumption may jump ninefold.

Less dramatic, but also in line for a 5-10% boost in use, is polyvinyl chloride. Total consumption during the old year amounted to 360 million lbs.; in the new, it may stretch up to 385 million (excluding copolymer content of polyvinyl acetate, butyral, etc.).

Rubber Recoup: The rubber industry, another hefty chemicals consumer, will pick up fatter orders, too. H. E. Humphreys, Jr., president of U.S. Rubber, avers that "1955 sales will probably be about $5 billion, or equal to the all-time high set in '53."

He pegs consumption of rubber at 1,255,000 long tons in '55—an upturn of 4%—which will just about counterpoise last year's 3.7% sag in rubber business.

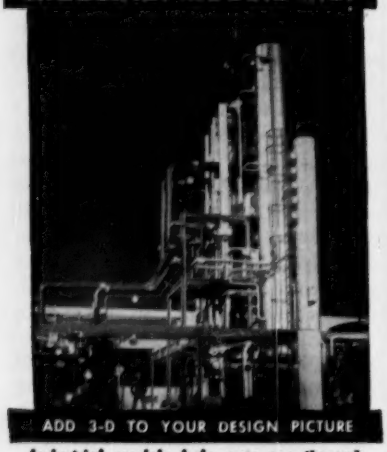
Hewitt-Robins' President Thomas Robins, Jr., concurs that business will be better. The nontire segment of the rubber industry, he says, shows promise of a 3-6% output increase. Some 800 companies making rubber products other than tires will draw slightly more than 36% of the rubber output in '55. That's 465,000 long tons, about 27,000 tons over '54.

Sulfur Stride: Sulfur, one of the raw materials of the rubber industry (as well as most others, including fertilizer, gasoline, rayon, pigment), "begins 1955 in a strong position to supply the needs of consumers." Those are the words of Freeport Sulphur's Langbourne Williams. This sizing up of the market follows a year in which U.S. output hit 6.6 million long tons—a production record-breaker.

With the new year, plans are going ahead that will further swell sulfur availability. Last year, Frasch-process production totaled 5.45 million tons—some 82.5% of all sulfur turned out.

But acceleration of sulfur production is not confined to the U.S. Paul Nachtman, head of Mexican Gulf Sulphur, made personal interviews in 14 countries, ventured this sulfur prediction: "1955 consumption in the nations visited will surpass '54's level by 10%."

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SPECIALTIES . .



DISPLAY STANDS: They turned the tide for the House of Huston.

Profits from Pets

Plenty of imagination and the ability to tie trends together—those are the factors that have made John Huston's company, House of Huston (Coral Gables, Fla.), one of the sharpest—and possibly the biggest—in the pet chemical specialties field.

The trends that Huston has capitalized on are these: the swelling pet population* and the ever-multiplying number of supermarkets. Also illustrating Huston's imagination: such fetching product names as Itch Witch, Detour, Handy Sandy, and Ear Cheer.

The combination has fostered a business that means "multimillion" dollars/year sales for Huston, although he shies at being more specific. But he does venture these figures on the market he's shooting for: pet care products, $38-million annual sales (not including sales of pet food, nor the $12 million spent yearly for veterinarians' services).

Peanuts to Pups: Huston hasn't always been in the pet care business. Until the middle '40s, he was busy running a package peanut concern in Columbus, Ga. Then he retired and went to Florida. Once there he discovered his pet dog was pestered by ticks, lice and fleas.

With some chemical knowledge (though he's not a graduate chemist), he decided to develop a product that would be a combination bath and insecticide. When it worked on his own dog and on those of his neighbors', he dubbed it Sunday Shower, started marketing it in Coral Gables.

On the strength of its success, he organized House of Huston in 1948 and set about developing sales for Sunday Shower and other products. During the first three years, the company concentrated on drugstores and pet shops. But as time went on, Huston found it more and more difficult to obtain adequate counter space. That's when he hit on the idea of display stands (*see cut*).

While the stands (they come in five sizes, the biggest holding some $450 worth of merchandise) were being introduced in established outlets, Huston set out to try a few in supermarkets. He discovered a gold mine.

Profits from a single supermarket installation, he found, equalled those of 14 nonsupermarket units. Result: today the firm has stands in thousands

* Dogs are reported to be increasing at a 15% faster rate than the human population in the U.S. Today, they number around 23 million, cats around 26 million. The parakeet population is also soaring—there are some 10 million in U.S. homes.

of supermarkets as well as in 20,000 other retail outlets. As for products, they have snowballed to some 150. (Of that number, around two dozen are chemical specialties.)

Payoff Policies: Here are some other formulas Huston exploited to put his company where it is today:

- Method of servicing outlets. Some 130 trucks operate nationwide, replenishing low stocks, removing items that are seasonal or aren't selling satisfactorily.
- Close quality control of raw materials going into products.
- Stress on continuously developing new items. Example: for two years work has been going on to perfect a worming pill for dogs that can be administered in a meat ball and won't require prior fasting or subsequent purging.

Another policy that has paid dividends is the practice of having a sizable number of items made on a contract basis. In addition, the Florida firm has much of its packaging done in other parts of the country to overcome the freight-cost disadvantage that stems from its being located in the deep South.

The over-all operation worked out so well that in the fall of 1953, Huston retired as head of the company. His hand-picked successor is William Hall, who had previously been brought in as a consultant. While Hall today is the more active of the two, both are still bent on coming up with new products that'll make the U.S. pet population healthy and pampered —and profitmakers for the Huston enterprise.

•

Thaw Warning: Frozen food packagers may be soon trying a new device to indicate if the food has thawed and been refrozen. Developed in Peru, it's called Temp-Tec. Principle involves Litmus paper and a capsule of an acidic chemical (undisclosed). Thawing melts the capsule, and the litmus turns red. The invention is still being tested.

•

Western Packer: Lawson Chemical Products Co. has been established in Culver City, Calif., to specialize in aerosol packaging.

•

Nonskid: A new product to "nonslip" concrete, wood, metal surfaces has been introduced by Walton-March (Chicago). Walton-March claims its product, NSC (for nonslip coating), requires less surface preparation than previously developed products, is fire resistant and waterproof. Composition: resins, polymerized oils, aluminum oxide. A 14.5-lb. container sells for $11.15, covers 100 sq. ft.

•

Detergent Probe: A pair of new reports available from U.S. Dept. of Commerce's Office of Technical Services (Room 6227, Commerce Building, Washington 25, D. C.) at $1 each: "A Fundamental Study of Foams and Emulsions" (Code No. PB 111420), and "Light Scattering by Detergent Solutions, and Heats of Solution of Detergents" (Code No. PB 111459).

•

Antimoth Campaign: The d-Con Co. (Chicago) has added two antimoth products to its line: Moth-Prufe and Cedar-On. Moth-Prufe is an aerosol for stored clothes; Cedar-On is also pressure packed, contains cedar oil and is a spray for drawers, closets. The pair is being promoted via a heavy TV and consumer magazine campaign.

•

Printed Word: Among the recent bulletins offered—

- Alpha Corp. (Stamford, Conn.) has a bulletin (No. 103) on "Fringe Area Lubrication with Molycote Lubricants." It concerns use of molybdenum disulfide extreme-pressure lubricants.
- American Alcolac Corp. (Baltimore) offers a brochure on its synthetic detergents for household products, cosmetics, and industrial uses.

•

Perennial Plague: Locusts, the scourge of the Middle East desert lands, have swarmed into Southern Morocco in the most serious invasion in several years. Supplies of aldrin and dieldrin have been rushed to the areas, along with BHC and arsenicals. Objective: to halt the locusts before orange, almond and olive crops have been destroyed. The locust-killing campaign is directed by the Food & Agriculture Organization in Rome, because the pests threaten the entire west Mediterranean area.

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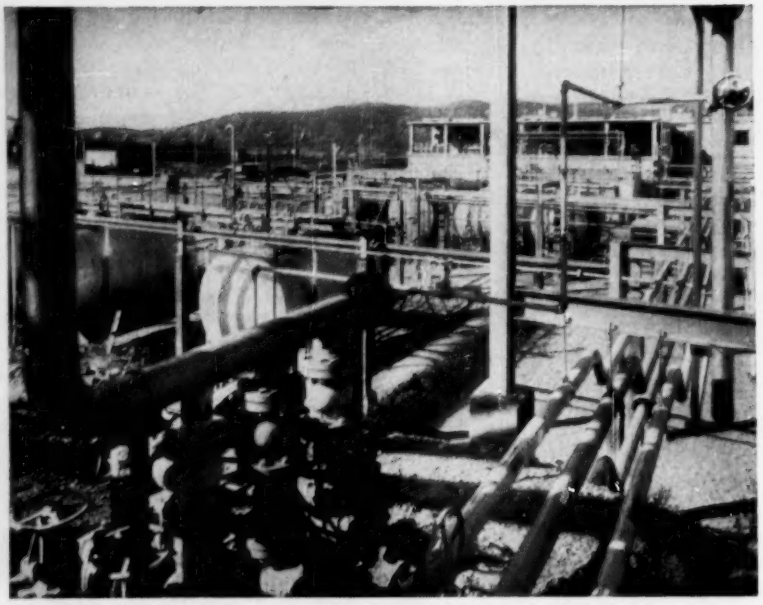
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DEVELOPMENT AT KOBUTA: New link between research and sales.

Koppers' Step to Profits

In the chemical industry, it's virtually axiomatic that the development of profitable new products is the only means by which sales volumes can be continuously expanded and profits increased.

Apparently accepting the above axiom, last week one well-known chemical company completed a giant move toward expanding its volume and profits. At Kobuta, Pa., the Chemical Division of Koppers Co., Inc. has just opened its new development unit.

Termed by Koppers "a combination laboratory and overgrown pilot plant," the new structure is aimed at two phases of product commercialization:

- Adapting research-developed material to commercial use.
- Producing semicommercial quantities for sampling by customers during market development.

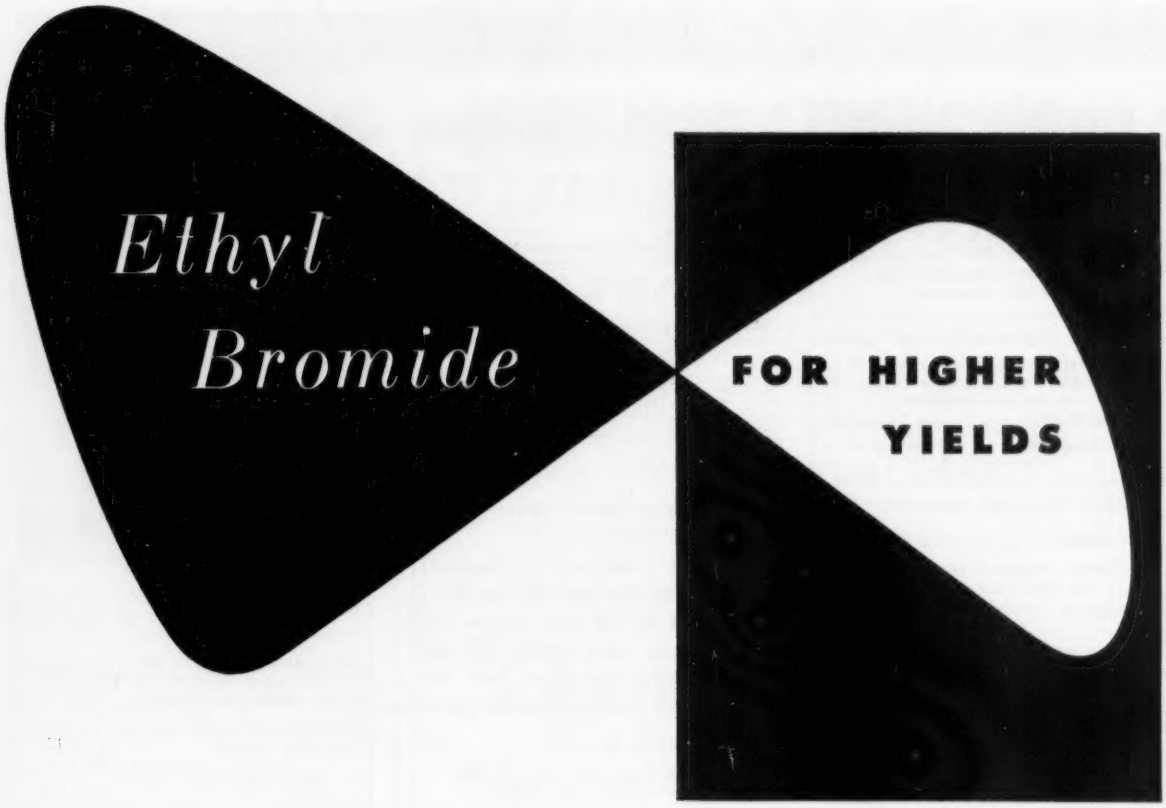
The development plant covers a 50,000-sq.-ft. area, about one-third of which is under cover. It was designed and erected by the Chemical and Gas Dept. of Koppers Engineering and Construction Division.

The main building houses a number of reactors approaching commercial size and provides facilities for centrifuging, drying, extruding and warehousing products processed at the new plant. In the centrifuging, drying and extruding areas, expansion space has been provided.

Specifically, the new plant will enable Koppers salesmen to offer more efficient development service to polystyrene and polystyrene-copolymer plastics customers. This move fills a gap that has been growing at Koppers over the past several years. For although the company has conducted an extensive research program in injection molded, extruded and expanded plastics, prior to the opening of the development plant much of the development work necessarily fell upon the basic research staff.

Another target: development and improvement of polymer and copolymer latices for uses in the paper, textile and paint industries.

Summing up his company's stand on its latest sales-developing project, Chemicals Vice-President George Walker asserted, "Construction of this type of plant is essential in keeping abreast of the ever-changing demands for new plastics covering a wide range of properties."



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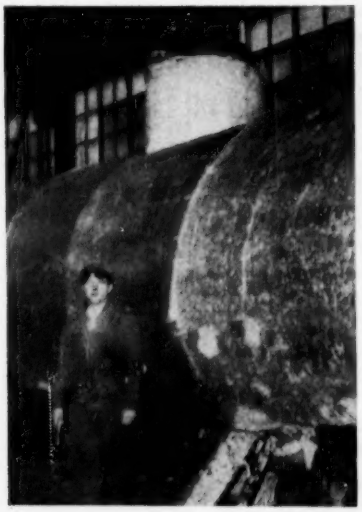
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CUSTOM BUILDING: More chemicals will travel in their own cars.

Chemical Carrier Surge

Just the other day, the Ohio-Apex Division, Food Machinery & Chemical Corp., placed in service two railroad tank cars with tanks constructed entirely of 20% nickel-clad steel. These new cars were designed specifically to carry phosphorus oxychloride.

As an isolated case, Ohio-Apex's move is indicative of the apparently uninterrupted trend toward the use of custom-built carriers by the chemical industry. Although this trend seems patent, to date there are few supporting, specific facts on how much of which chemicals are being carried in special cars. A just-completed survey will, however, supply some missing pieces for solving the chemical tank-car jigsaw puzzle.

Shippers' Car Line Corp. has compiled figures of its leasing operations in the chemical industry, comparing its late-1944 with current operations:

	1944	*1954*
Total leased fleet	7600	13,000
Leased to chemical companies	1421	5420
Per cent in chemicals	18.7	41.7

That Shippers is leaning toward chemicals is evident from a comparison with recent national figures released by the Assn. of American Railroads:

Total privately owned tank cars	158,000
Total in chemical service	27,000
Per cent in chemicals	17.1

But the tremendous surge toward

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If you are considering new projects or Company acquisitions in your growth picture, perhaps we can be helpful even though your Company may not need financing.

For information consult:

Chemical Department

RICHARD B. SCHNEIDER, *Vice President*

Empire Trust Company

7 WEST 51st STREET, NEW YORK 19, N. Y.

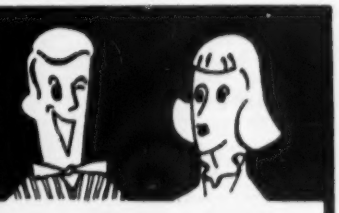
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chemical car specialization can best be appreciated from Shippers' analysis of chemical types. Here is the detailed breakdown:

	Cars		% increase
	1944	1954	
Sulfuric acid	120	323	165
Chlorine	115	531	361
Pressure cars (except chlorine); e.g., LPG, anhydrous ammonia, sulfur dioxide, carbon dioxide, metallic sodium	175	2073	1083
Covered hopper cars	140	870	522
Misc. aluminum tank, rubber lined, etc.)	150	503	235
Total specialized cars (mostly chemical)	700	4300	514

Obviously only a company-by-company compilation will yield the overall picture of what's happening in the custom-built chemical carrier field. Shippers' Car Line proportions may not necessarily hold for the entire country. Furthermore, the analysis is complicated by the tendency of petrochemical makers to convert some of their petroleum cars to chemicals cars.

This much is certain, however: with more chemicals being shipped in tank-car quantity than ever before, convenience in handling, made possible by specialized equipment, will continue to spark the boom in custom-built carriers.

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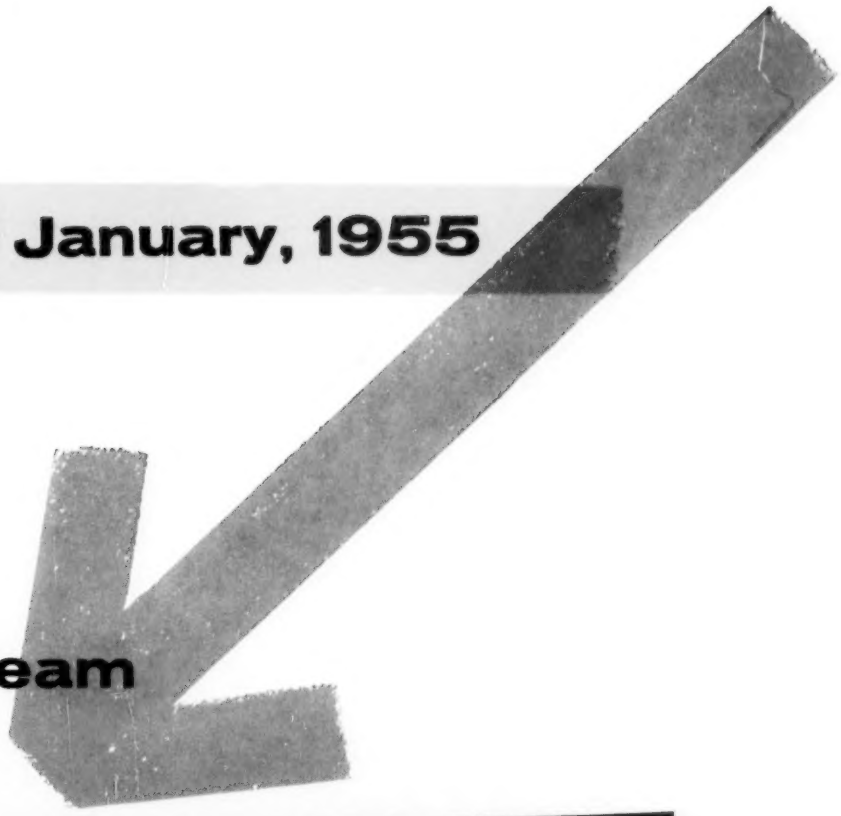
Ready for Reference: Teflon—a 60-p. booklet outlining general characteristics, manufacture, uses, properties, processing techniques, and fabricating methods for Teflon. Du Pont, Polychemical Dept., Wilmington, Del.

• Metallic stearates—26-p. brochure providing technical data and suggested uses for various salts of stearic acid. Synthetic Products Co., Cleveland.

• Molybdenum compounds – 8-p. booklet tabulating various thermodynamic properties for 11 molybdenum compounds. Some of the data: melting points and heats of fusion, boiling points and heats of vaporization, heat capacity, vapor pressure, entropy and free energy. Climax Molybdenum Co., New York City.

• Aluminum Chloride – technical leaflet supplying specification, suggested uses, physical properties, and handling information. Hooker Electrochemical Co., Niagara Falls, N. Y.

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